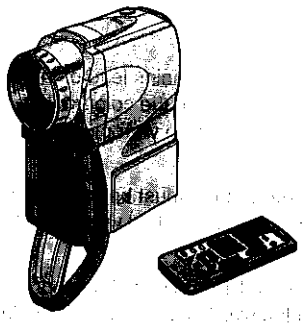
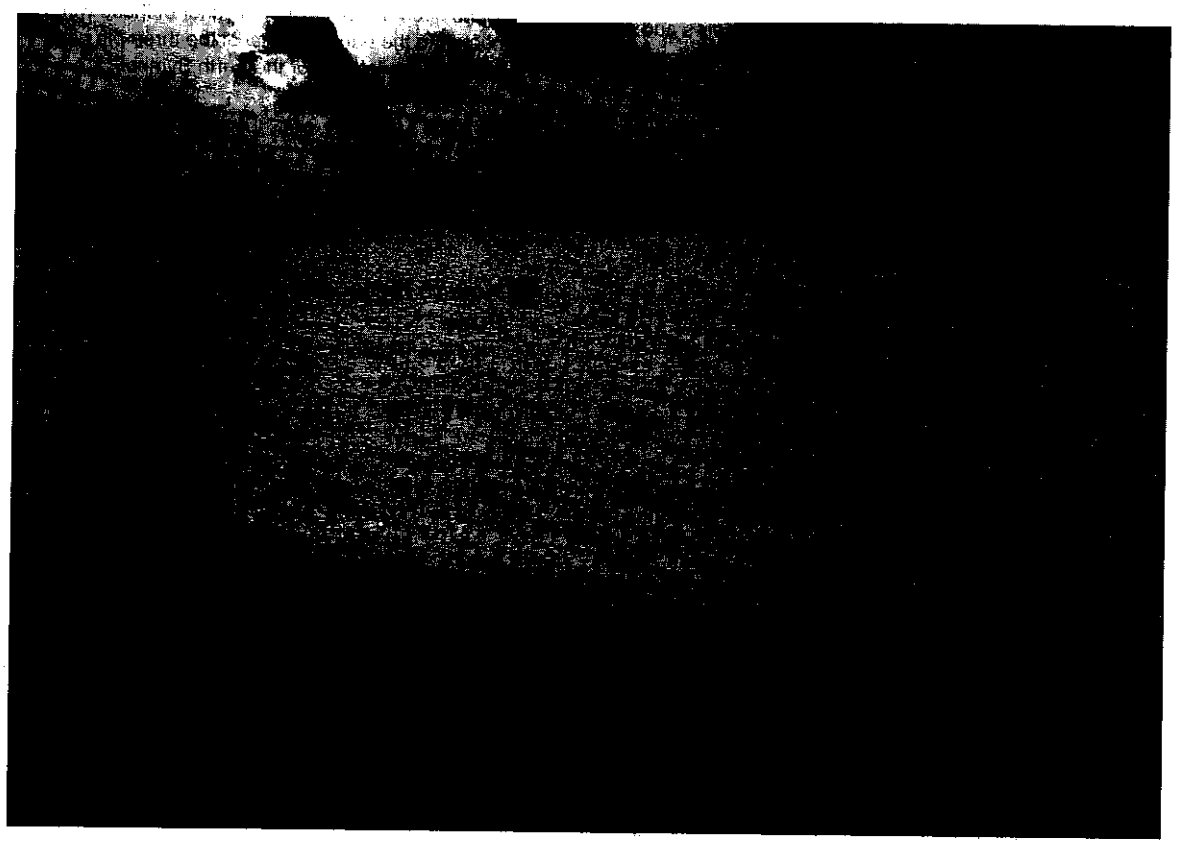
Panasonic

Model No.
NV-EX21

Digital Video Camera



Operating Instructions



Mini DV PAL

MultiMediaCard™

SD™

LEICA DICOMAR

CERTIFIED USB™

Before use, please read these instructions completely.

VQT9435

Before Use

Dear Customer,

We would like to take this opportunity to thank you for purchasing this Panasonic Movie Camera. Please read these Operating Instructions carefully and keep them handy for future reference. Please note that the actual controls and components, menu items, etc. of your Movie Camera may look somewhat different from those shown in the illustrations in these Operating Instructions.

Information for Your Safety

Movie Camera

- The rating plate is on the underside of the Movie Camera.

AC Adaptor

- The rating plate is on the underside of the AC Adaptor.
- As this equipment gets hot during use, operate it in well ventilated place; do not install this equipment in a confined space such as a bookcase or similar unit.

Caution for AC mains lead

For your safety, please read the following text carefully.

This appliance is supplied with a moulded three-pin mains plug for your safety and convenience. A 5-ampere fuse is fitted in this plug.
Should the fuse need to be replaced, please ensure that the replacement fuse has a rating of 5-amperes and it is approved by ASTA or BSI to BS1362.
Check for the ASTA mark ⓐ or the BSI mark ♆ on the body of the fuse.

If the plug contains a removable fuse cover you must ensure that it is refitted when the fuse is replaced. If you lose the fuse cover, the plug must not be used until a replacement cover is obtained. A replacement fuse cover can be purchased from your local Panasonic Dealer.

IF THE FITTED MOULDED PLUG IS UNSUITABLE FOR THE SOCKET OUTLET IN YOUR HOME THEN THE FUSE SHOULD BE REMOVED AND THE PLUG CUT OFF AND DISPOSED OF SAFELY.
THERE IS A DANGER OF SEVERE ELECTRICAL SHOCK IF THE CUT OFF PLUG IS INSERTED INTO ANY 13-AMPERE SOCKET.

If a new plug is to be fitted, please observe the wiring code as shown below.
If in any doubt, please consult a qualified electrician.

■IMPORTANT

The wires in this mains lead are coloured in accordance with the following code:

Blue: Neutral
Brown: Live

As the colours of the wires in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

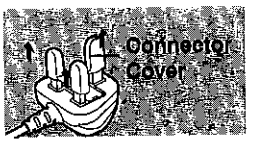
The wire which is coloured BLUE must be connected to the terminal in the plug which is marked with the letter N or coloured BLACK.

The wire which is coloured BROWN must be connected to the terminal in the plug which is marked with the letter L or coloured RED.

Under no circumstances should either of these wires be connected to the earth terminal of the three-pin plug, marked with the letter E or the Earth Symbol ⏚.

■Before Use

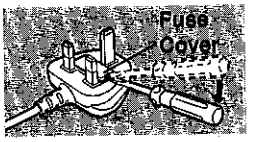
Remove the Connector Cover as follows.

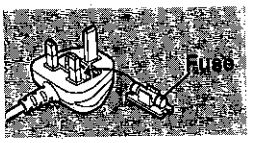


■How to replace the Fuse

1) Remove the Fuse Cover with a screwdriver.

2) Replace the fuse and attach the Fuse Cover.





Operating Instructions

- Windows is a trademark or registered trademark of Microsoft Corporation U.S.A.
- SD Logo is a trademark.
- Leica is a registered trademark of Leica microsystems IR GmbH and Dicomar is a registered trademark of Leica Camera AG .
- All other company and product names in the operating instructions are trademarks or registered trademarks of their respective corporations.

Files recorded on a MultiMediaCard or SD Memory Card

It may not be possible to play back the pictures on this Movie Camera recorded on and created by other equipment or vice versa. For this reason, check the compatibility of the equipment in advance.

Pages for reference

Pages for reference are indicated with an arrow, for example: **(➔ 00)**

■WARNING

To reduce the risk of fire or shock hazard and annoying interference, use only the recommended accessories and do not expose this equipment to rain or moisture. Do not remove the cover (or back); there are no user serviceable parts inside. Refer servicing to qualified service personnel.

■Carefully observe copyright laws.

Recording of pre-recorded tapes or discs or other published or broadcast material for purposes other than your own private use may infringe copyright laws. Even for the purpose of private use, recording of certain material may be restricted.

Contents

Before Use

Information for Your Safety 2
Contents 3
Standard Accessories 4
Optional Accessories 4
Getting Started 5
Viewing What Has Been Recorded 5
Controls and Components 6
Remote Controller 8
Power Supply 10
Charging Time and Available Recording Time 10
Attaching the Lens Cap 11
Adjusting the Grip Belt 11
Inserting a Cassette 11
Turning on the Movie Camera and Selecting Modes 12
Using the Viewfinder/LCD Monitor 12
Using the Menu Screen 13
List of Menus 14
Internal Lithium Battery Recharge 17
Setting Date and Time 17
LP Mode 17
Audio Recording Mode 17

CAMERA Mode

Recording 18
Photoshot 19
Zoom In/Out Functions 19
Digital Zoom Function 20
Image Stabilizer Function 20
Fade In/Out Functions 20
Cinema Function 21
Backlight Compensation Function 21
Recording in Special Situations 21
Recording in Natural Colours 22
Adjusting White Balance Manually 22
Manual Shutter Speed Adjustment 23
Manual Iris Adjustment 23
Manual Focus Adjustment 23
Digital Effect Functions 24

VCR Mode

Playing Back 26
Finding a Scene You Want to Play Back 26
Slow Motion Playback 27
Still Playback/Still Advance Playback 27
Finding the End of Recording 27
Index Search Functions 28
Playback Zoom Function 29
Playback Digital Effect Functions 29
Playing Back on Your TV 31
Copying on an S-VHS (or a VHS) Cassette 31
Recording the Contents of Other Equipment 31
Audio Dubbing 32
Using the DV Cable for Recording 32

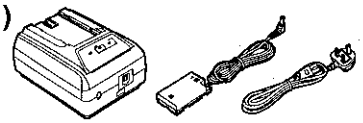
CARD Mode

DV Camera Style and SD Camera Style 33
Attaching the Battery Adaptor Unit 33
Attaching the Battery 33
Using a Card 34
Recording on a Card 34
Using the Video Flash 36
Playing Back a Card 37
Recording Pictures on a Card to a Tape 38
Slide Show 39
Creating a Title 40
Adding a Title 40
Protecting the Files on a Card 41
Deleting the Files Recorded on a Card 41
Formatting a Card 42
Writing Printing Data on a Card 42
Using the USB Connection Kit 43
Personal Computer Connection Kit 43

Others

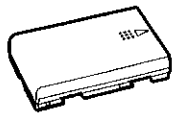
Indications 44
Owner ID 45
Warning/Alarm Indications 45
Notes and Hints 46
Cautions for Use 52
Before Requesting Repair (Problems and Solutions) 54
Explanation of Terms 56
Specifications 57
Index 58

1)



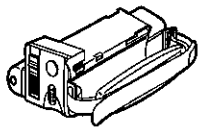
K2GJ2DZ00012 VJA0940
VSK0592

2)



CGA-D07S

3)



VSK0605

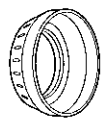
4)

CR2025 N2QAEC000003

5)

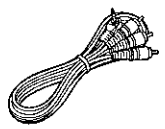
VFC3734

6)



VYP8344

7)

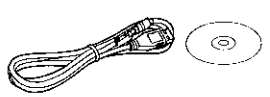


K2KC4CB00002

8)

VFA0353

9)



VFA0363 VFF0120

Standard Accessories

Illustrated on the left are accessories supplied with the Movie Camera.

1) **AC Adaptor, DC Input Lead and AC Mains Lead (➔ 10)**
2) **Battery Pack (➔ 10)**
3) **Battery Adaptor Unit (➔ 33)**
4) **Remote Controller and Button-Type Battery (➔ 8, 9)**
5) **Lens Cap (➔ 11)**
6) **Lens Hood for MEGA Still Picture Recording (➔ 34, 54)**
   - By attaching supplied Lens Hood for MEGA Still Picture Recording that blocks direct sunlight in Mega-Pixel Recording, you can get better image. However, Lens Cap cannot be attached.
7) **AV Cable (➔ 31)**
8) **SD Memory Card (➔ 34)**
9) **USB Connection Kit (➔ 43)**

Optional Accessories

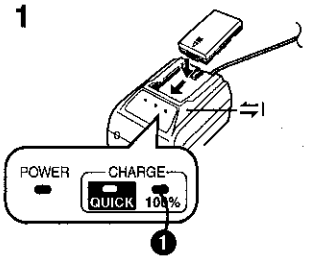
1) AC Adaptor (VW-AD9B)
2) Battery Pack (Lithium/CGA-D07S/700mAh)
3) Battery Pack (Lithium/CGR-D08S/CGR-D120/800mAh)
4) Battery Pack (Lithium/CGP-D14S/CGP-D210/1400mAh)
5) Battery Pack (Lithium/CGR-D16S/CGR-D220/1600mAh)
6) Battery Pack (Lithium/CGR-D53S/CGR-D815/5300mAh)
7) Car Battery Charger (VW-KBD2E)
8) Car Adaptor Cord (VW-KA7E)
9) Wide Conversion Lens (VW-LW3707ME)
10) Tele Conversion Lens (VW-LT3714ME)
11) ND Filter (VW-LND37E)
12) MC Protector (VW-LMC37E)
13) Tripod (VZ-CT55E)
14) Personal Computer Connection Kit (VW-DTA10B/VW-DTA9E)
15) DV Cable (VW-CD1E)
16) SD Memory Card Application Software (VW-SWA1E)
    - "TitleStudio" software for title creation, and "SD-Jukebox" software for recording music are included. (However, this Movie Camera cannot play back music.)
17) SD Memory Card (RP-SD008/RP-SD016/RP-SD032/RP-SD064)
18) MultiMediaCard (VW-MMC8E/VW-MMC16E)
19) PC Card Adaptor for SD Memory Card (BN-SDABPE)
20) USB Reader Writer for SD Memory Card (BN-SDCAPE)
21) DV Editing Software with DV Interface Board (VW-DTM21E)
22) DV Editing Software with DV Interface Card (VW-DTM22E)
23) DV Editing Software (VW-DTM20E)

- Some optional accessories may not be available in some countries.

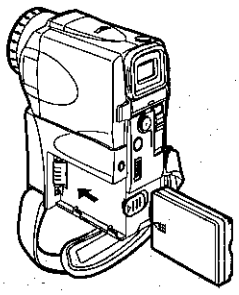
Shop @ Panasonic

- Order accessory and consumable items for all Audio Visual Products with ease and confidence either by telephoning our Customer Care Centre on **08705 357357 Mon–Friday 9:00am–5:30pm**
- Or go on line through our Internet Accessory ordering application at **www.panasonic.co.uk.**
- Most major credit and debit cards accepted.
- All enquires transactions and distribution facilities are provided directly by Panasonic UK Ltd.
- It couldn't be simpler!

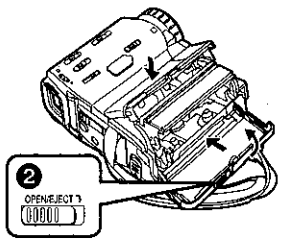
1



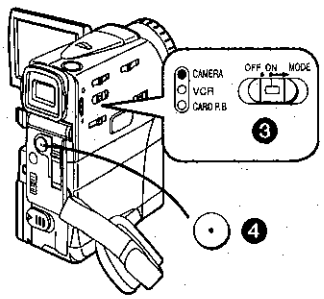
2



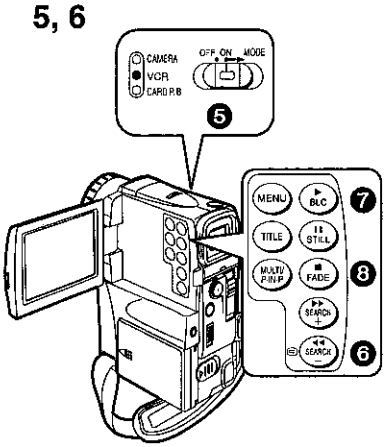
3



4



5, 6



Getting Started

1 Charge the Battery. (➔ 10)

- Attach the Battery to the AC Adaptor.
- Connect the AC Mains Lead. (Charging starts.)
- After the [POWER] Lamp has lighted up, the [CHARGE] Lamp flashes. When the [100%] Lamp ❶ on the AC Adaptor is lit, charging is finished.

2 Attach the Charged Battery to the Movie Camera. (➔ 10)

3 Insert the Cassette. (➔ 11)

- Slide the ❷ Lever to open.
- Insert the Cassette.
- Close the Cassette Compartment Covers.

4 Turn the Movie Camera on and start recording. (➔ 12, 18)

- Set the ❸ Switch to [ON]. (The [CAMERA] Lamp lights up.)
- Press the ❹ Button. (Recording starts.)
- Press the ❹ Button again to pause the recording.

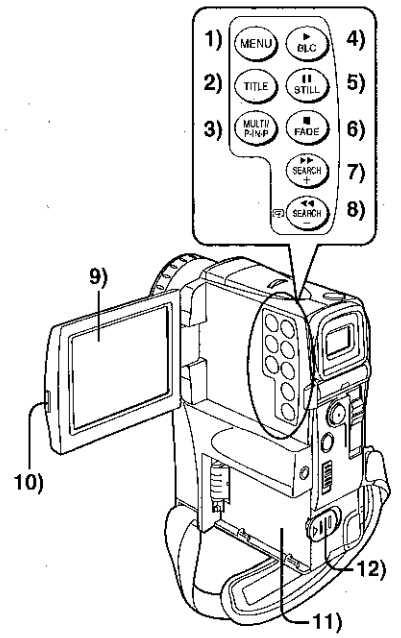
Viewing What Has Been Recorded

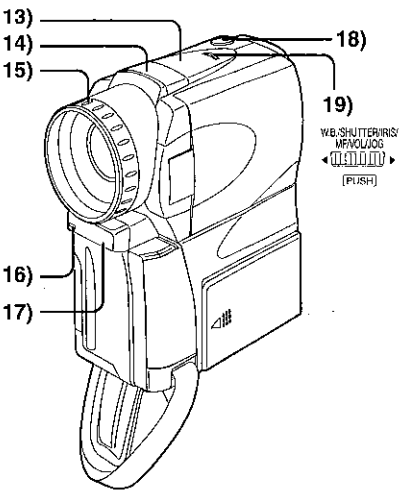
5 Switch to the VCR Mode, rewind the tape, and play the tape back. (➔ 26)

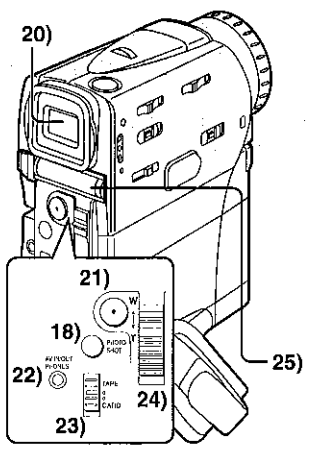
- Slide the ❺ Switch. (The [VCR] Lamp lights up.)
- Press the ❻ Button. (Rewind the tape.)
- Press the ❼ Button. (Playback starts.)
- Press the ❽ Button. (Playback stops.)

6 Turn the Movie Camera off. (➔ 12)

- Set the ❺ Switch to [OFF].







Controls and Components

Movie Camera (DV Camera Style)

1) **Menu Button [MENU] (➔ 13)**
2) **Title Button [TITLE] (➔ 40)**
3) **Multi-Picture Button [MULTI] (➔ 25, 30, 37, 40)**
   Picture-in-Picture Button [P-IN-P] (➔ 25)
4) **Backlight Button [BLC] (➔ 21)**
   Play Button [▶] (➔ 26, 37, 39)
5) **Still Button [STILL] (➔ 19)**
   Pause Button [❚❚] (➔ 27, 39, 45)
6) **Fade Button [FADE] (➔ 20)**
   Stop Button [■] (➔ 26, 39)
7) **Forward Search Button [SEARCH+] (➔ 18)**
   Fast Forward/Cue Button [▶▶] (➔ 26)
8) **Reverse Search Button [–SEARCH] (➔ 18)**
   Rewind/Review Button [◀◀] (➔ 26)
   Recording Check Button [⟲] (➔ 18)
9) **LCD Monitor (➔ 12, 54)**

- **Due to limitations in LCD production technology, there may be some tiny bright or dark spots on the LCD Monitor screen. However, this is not a malfunction and does not affect the recorded picture.**

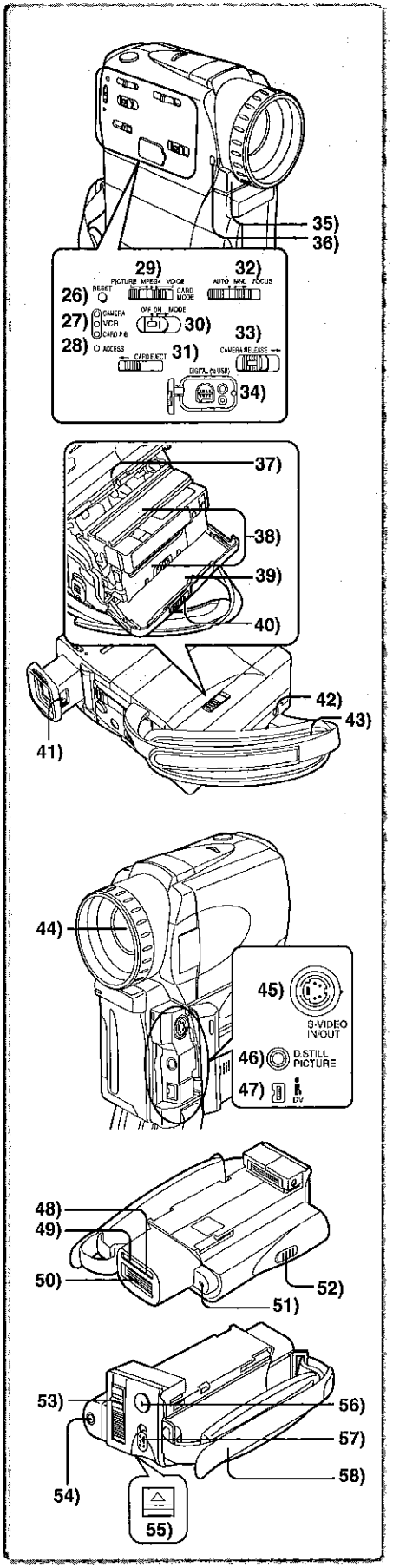
---

10) **LCD Monitor Open Button [PUSH OPEN] (➔ 12)**
11) **Battery Holder**
12) **Battery Eject Lever [BATTERY EJECT] (➔ 10)**
13) **Speaker (➔ 26)**
14) **Microphone (built-in, stereo) (➔ 32)**
15) **Lens Hood (➔ 54)**
16) **Recording Lamp (➔ 18)**
17) **Remote Control Sensor (➔ 9)**
18) **Photoshot Button [PHOTO SHOT] (➔ 19, 34, 38, 40)**
19) **Multi-Function Dial [PUSH] (➔ 13, 22, 23, 26)**
20) **Viewfinder (➔ 12, 54)**

- **Due to limitations in LCD production technology, there may be some tiny bright or dark spots on the Viewfinder screen. However, this is not a malfunction and does not affect the recorded picture.**

---

21) **Recording Start/Stop Button (➔ 18)**
22) **Audio-Video Input/Output Socket [AV IN/OUT] (➔ 31)**
    Headphone Socket [PHONES] (➔ 48)
    - Connecting an AV Cable to this socket activates the Movie Camera's built-in speaker, but connecting a headphone, etc. deactivates it.
23) **Tape/Card Selector [TAPE/CARD] (➔ 34)**
24) **Zoom Lever [W/T] (➔ 19)**
25) **Card Slot (➔ 34)**



26) Reset Button [RESET] (➜ 45)
27) Operation Mode Lamps (➜ 12, 18, 26, 37)
28) Card Access Lamp [ACCESS] (➜ 34)
29) Card Mode Selector Switch [PICTURE/MPEG4/VOICE] (➜ 34, 35, 37)
30) Movie Camera Off/On Switch [OFF/ON/MODE] (➜ 12, 18, 52)
31) Card Eject Lever [CARD EJECT] (➜ 34)
32) Mode Selector Switch [AUTO/MNL/FOCUS] (➜ 18, 22, 23)
33) Camera Release Lever [CAMERA RELEASE] (➜ 33)
34) USB Socket [DIGITAL (to USB)] (➜ 43)
35) White Balance Sensor (➜ 56)
36) Lens Cap Installation Hole (➜ 11)
37) Upper Cassette Compartment Cover (➜ 11)
38) Cassette Holder (➜ 11)
39) Lower Cassette Compartment Cover (➜ 11)
40) Cassette Eject Lever [OPEN/EJECT] (➜ 11)
41) Eyepiece Corrector Knob (➜ 12)
42) Tripod Receptacle
- Used for mounting the Movie Camera on an optional tripod.

43) Grip Belt (➜ 11)
44) Lens (LEICA DICOMAR)
45) S-Video Input/Output Socket [S-VIDEO IN/OUT] (➜ 31)
46) Digital Still Picture Terminal [D.STILL PICTURE] (➜ 43)
47) DV Terminal (i.LINK) [i] (➜ 32)
- Connect this to the digital video equipment.
- "i.LINK" is the name of connectors in accordance with IEEE1394-1995. "i" is a logo marked on products comforming with the "i.LINK" specifications.

Battery Adaptor Unit

48) Sensor
49) Recording Lamp (➜ 35)
- This Lamp indicates that it's in use when recording Moving Picture (MPEG4) or recording Voice.

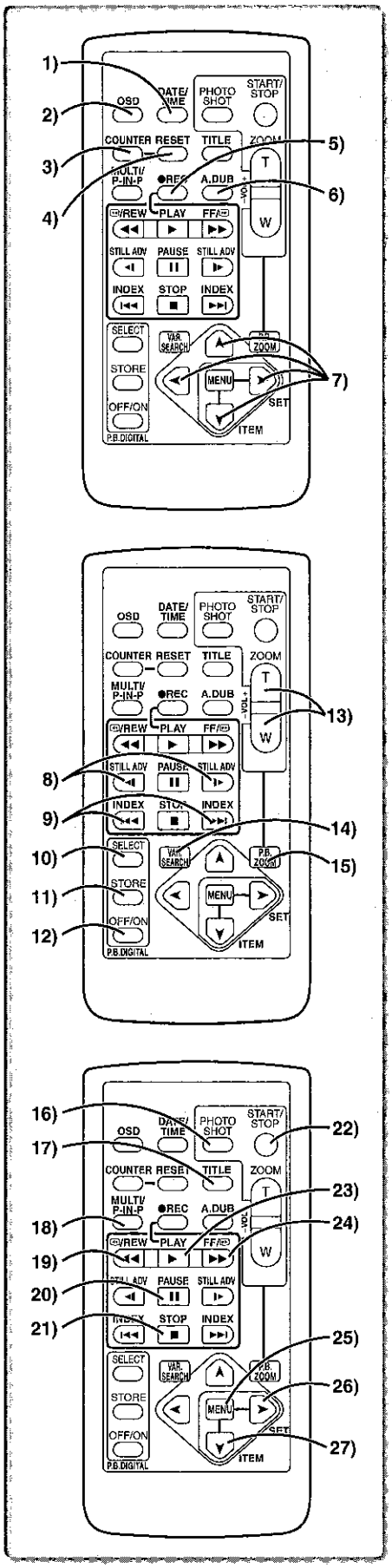
50) Video Flash (➜ 36)
51) Microphone (built-in, Monaural) (➜ 32)
52) Audio-Video Output/Phones Selector Switch [AV OUT/PHONES]
- Set this switch to [AV OUT] when watching on a TV **(➜ 31)** or dubbing **(➜ 31, 32)**, to [PHONE] when using headphones.
- If this switch is not set to [PHONES], you may hear some noise.
- If an AV Cable is connected while [AV OUT] is selected, LCD display will disappear.

53) Zoom Lever [W/T]
- This functions in the same manner as the 24) of the DV Camera Style.

54) Audio-Video Output/Phones Socket [AV OUT/PHONES] (➜ 31, 48)
55) Battery Eject Lever (➜ 33)
- It is located behind the battery.

56) Recording Start/Stop Button (➜ 35)
- This Button is to record Moving Picture (MPEG4) and Voice.

57) Battery Open Lever [OPEN] (➜ 33)
58) Grip Belt
- This functions in the same manner as the 43) of the DV Camera Style.



Remote Controller

Using the wireless Remote Controller that is supplied with the Movie Camera, most of the Movie Camera functions can be operated from a distance.

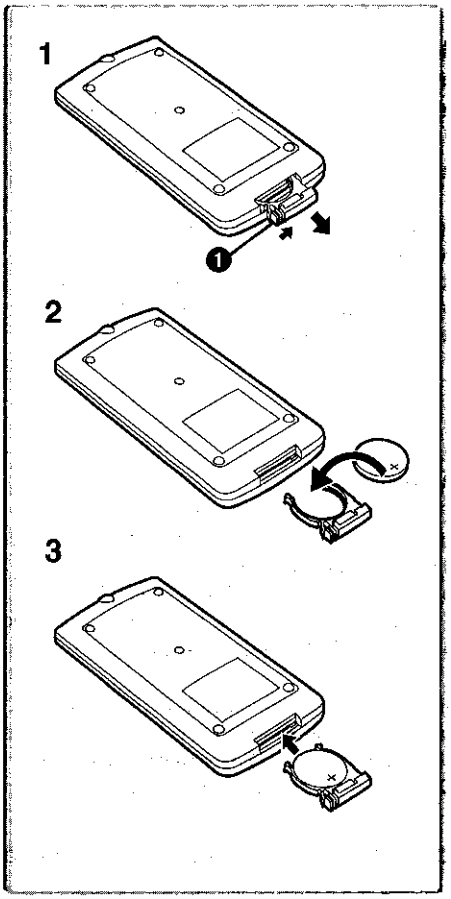
- Remote controller can only be used in DV Camera Style.

Buttons on the Remote Controller

1) **Date/Time Button [DATE/TIME] (➔ 45)**
2) **Indication Output Button [OSD] (➔ 31)**
3) **Counter Indication Shift Button [COUNTER] (➔ 45)**
4) **Reset Button [RESET] (➔ 56)**
5) **Recording Button [REC] (➔ 31, 32)**
6) **Audio Dubbing Button [A.DUB] (➔ 32)**
7) **Cursor Buttons for Variable Speed Search Function [▲, ▼] (➔ 26)**
   Direction Buttons for Playback Zoom Function [▲, ▼, ◄, ►] (➔ 29)
8) **Slow Motion/Still Advance Buttons [◄I, I►] (◄I: reverse, I►: forward) (➔ 27)**
9) **Index Search Buttons [I◄◄, ►►I] (I◄◄:reverse, ►►I:forward) (➔ 28)**
10) **Selection Button [SELECT] (➔ 29)**
11) **Store Button [STORE] (➔ 29)**
12) **Off/On Button [OFF/ON] (➔ 29)**
13) **Zoom/Volume Button [ZOOM/VOL] (➔ 19, 26, 29)**
14) **Variable Speed Search Button [VAR.SEARCH] (➔ 26)**
15) **Playback Zoom Button [P.B. ZOOM] (➔ 29)**

The following buttons function in the same manner as the corresponding buttons on the Movie Camera.

16) **Photoshot Button [PHOTO SHOT] (➔ 19, 34, 38, 40)**
17) **Title Button [TITLE] (➔ 40)**
18) **Multi-Picture/Picture-in-Picture Button [MULTI/P-IN-P] (➔ 25, 30, 37)**
19) **Rewind/Review Button [◄◄] (➔ 18, 26)**
20) **Pause Button [❚❚] (➔ 27, 39)**
21) **Stop Button [■] (➔ 26, 39)**
22) **Recording Start/Stop Button [START/STOP] (➔ 18)**
23) **Play Button [►] (➔ 26, 39)**
24) **Fast-forward/Cue Button [►►] (➔ 18, 26)**
25) **Menu Button [MENU] (➔ 13)**
26) **Set Button [SET] (➔ 13)**
27) **Item Button [ITEM] (➔ 13)**



Inserting a Button-type Battery

Before using the Remote Controller, insert the supplied button-type battery.

1 **While pressing the Stopper ❶, pull out the Battery Holder.**
2 **Insert the button-type battery with the imprint (+) facing upward.**
3 **Insert the Battery Holder into the Remote Controller.**

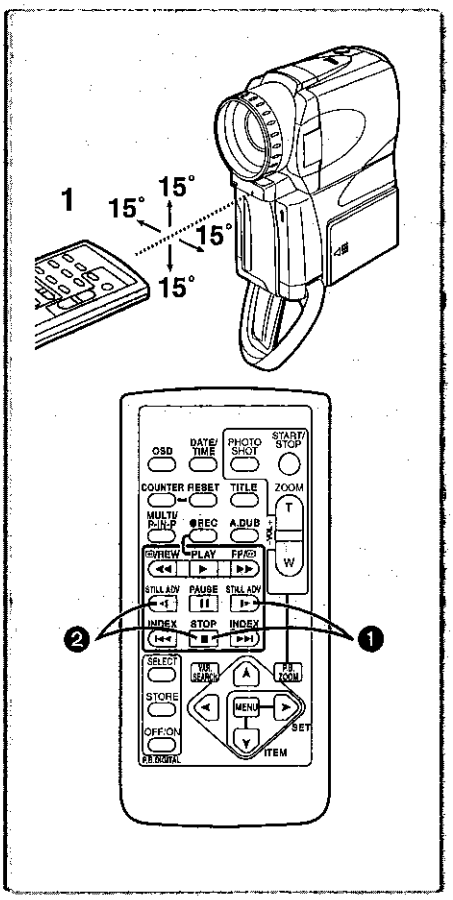
- When the button-type battery is exhausted, replace it with a new CR2025 battery. (A battery is normally expected to last about 1 year. However, it depends on operation frequency.)
- Make sure to match the poles correctly when inserting the battery.

CAUTION

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the equipment manufacturer. Discard used batteries according to manufacturer's instructions.

WARNING

Risk of fire, explosion and burns. Do not recharge, disassemble, heat above 100°C or incinerate. Keep the Button-Type battery out of the reach of children. Never put Button-Type battery in mouth. If swallowed call your doctor.



Using the Remote Controller

1 **Direct the Remote Controller to the Remote Control Sensor of the Movie Camera and press an appropriate button.**
   - Distance from the Movie Camera: Within approximately 5 metres
   - Angle: Within approximately 15° in the vertical and horizontal directions from the central axis

- The above operative ranges are for indoor use. Outdoors or under strong light, the Movie Camera may not operate properly even within the above ranges.
- Within a 1-metre range, you can also use the Remote Controller on the side (the LCD Monitor side) of the Movie Camera.

Selecting Remote Controller Modes

When 2 Movie Cameras are used simultaneously, they can be operated individually by selecting different Remote Controller Modes.

- If the Remote Controller Mode of the Movie Camera and that of the Remote Controller do not match, [REMOTE] Indication is displayed.

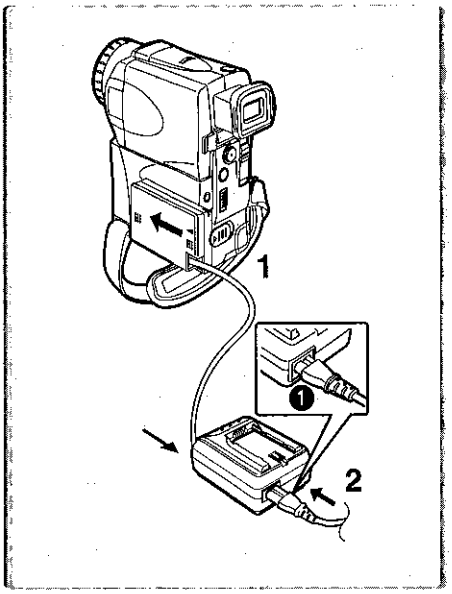
Setup on the Movie Camera:

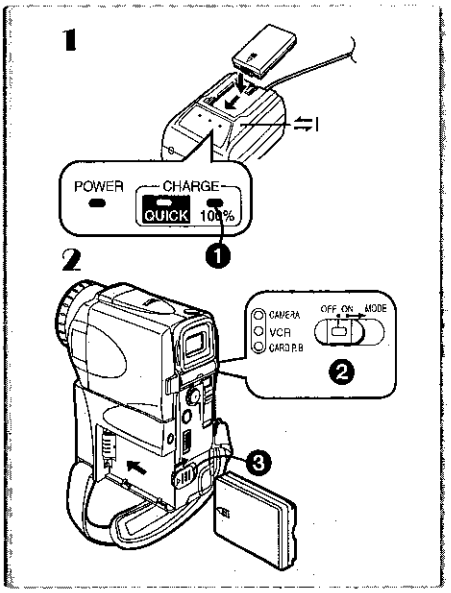
Set [REMOTE] on the [OTHER FUNCTIONS] Sub-Menu to the desired Remote Controller Mode. **(➔ 13)**

Setup on the Remote Controller:

[VCR1]: Press the [▶] Button and [■] Button simultaneously. ❶
[VCR2]: Press the [◀] Button and [■] Button simultaneously. ❷

- When the battery in the Remote Controller is replaced, the mode is automatically reset to [VCR1] Mode.





		NV-EX21
CGA-D07S	Ⓐ	1 h 20 min.
	Ⓑ	1 h 05 min. (55 min.)
	Ⓒ	35 min. (30 min.)
CGR-D08S CGR-D120	Ⓐ	1 h.
	Ⓑ	1 h 15 min. (1 h 05 min.)
	Ⓒ	40 min. (35 min.)
CGP-D14S CGP-D210	Ⓐ	1 h 30 min.
	Ⓑ	2 h 10 min. (1 h 45 min.)
	Ⓒ	1 h 05 min. (55 min.)
CGR-D16S CGR-D220	Ⓐ	1 h 10 min.
	Ⓑ	2 h 30 min. (2 h 05 min.)
	Ⓒ	1 h 15 min. (1 h 05 min.)
CGR-D53S CGR-D815	Ⓐ	4 h 30 min.
	Ⓑ	8 h 15 min. (6 h 45 min.)
	Ⓒ	4 h 10 min. (3h 25 min.)

Power Supply

■Using the AC Adaptor

1 Insert the battery-shaped connector of the DC Input Lead into the Battery Holder on the Movie Camera and slide it toward the front until it locks with a click.

2 Connect the AC Mains Lead to the AC Adaptor and the AC mains socket.

- The AC Mains Lead's output plug cannot be pushed fully into the AC Adaptor socket. A gap will remain as shown ❶.
- **Before connecting or disconnecting the power supply, set the [OFF/ON/MODE] Switch on the Movie Camera to [OFF] and make sure that the Operation Mode Lamps go off.**

■Using the Battery

Before use, fully charge the Battery.

1 Attach the Battery to AC Adaptor and charge it.

- Since the Battery will not be charged when the DC Input Lead is connected to the AC Adaptor, disconnect them.
- After the [POWER] Lamp has lighted, the [CHARGE] Lamp flashes. When the [100%] Lamp ❶ on the AC Adaptor is lit, charging is finished.

2 Attach the charged Battery to the Movie Camera.

To Remove the Battery

Set the [OFF/ON/MODE] Switch ❷ to [OFF], and the [BATTERY EJECT] Lever to the right ❸, and then slide the Battery to remove it.

- **When attaching or removing battery, set [OFF/ON/MODE] Switch to [OFF] and make sure the Operation Mode Lamp is not lit.**

■Supplying Power from the Cigarette Lighter Socket in a Car

The use of the Car Adaptor Cord (VW-KA7E; optional) together with the AC Adaptor makes it possible to supply power to the Movie Camera in a car for recording and playback. It also allows charging the Movie Camera's Battery.

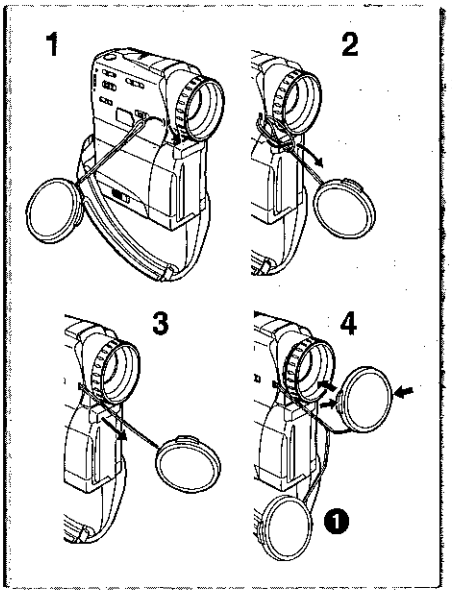
- After use, be sure to disconnect the Car Adaptor Cord from the Cigarette Lighter Socket.
- Be sure to start the car engine before you connect the Car Adaptor Cord, otherwise the fuse may blow.

- For other notes concerning this item, see page 46.

Charging Time and Available Recording Time

Ⓐ Charging Time
Ⓑ Maximum Continuous Recording Time
Ⓒ Intermittent Recording Time
(Intermittent Recording Time is the available recording time with repeated recording and stopping actions.)

- "1h30min." indicates 1 hour and 30 minutes.
- Battery CGA-D07S is supplied.
- The times shown in the table are approximate times. The numbers in parentheses indicate the recording time when the LCD Monitor is used. In actual use, the available recording time may be shorter.
- The times shown in the table are for continuous recording at a temperature of 20°C and humidity of 60%. If the Battery is charged at a higher or lower temperature, the charging time may be longer.

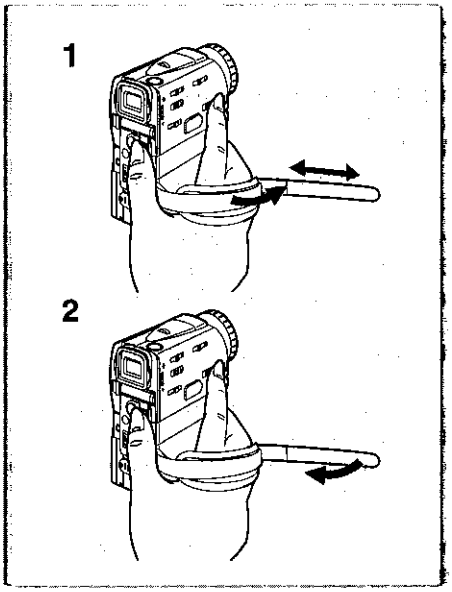


Attaching the Lens Cap

To protect the Lens surface, attach the Lens Cap.

1 **Pass the loop of the Lens Cap Cord through the Lens Cap Installation Hole on the Movie Camera.**
2 **Pass the opposite side of the Lens Cap Cord through the cord's hoop.**
3 **Pull the Lens Cap to the direction of the arrow.**
4 **Attach the Lens Cap.**

- The removed Lens Cap can be hooked onto the Grip Belt ❶. (When you are not recording, be sure to keep the Lens Cap attached to the Lens for protection.)
- If the supplied Lens Hood for MEGA Still Picture Recording is attached, the Lens Cap cannot be attached.

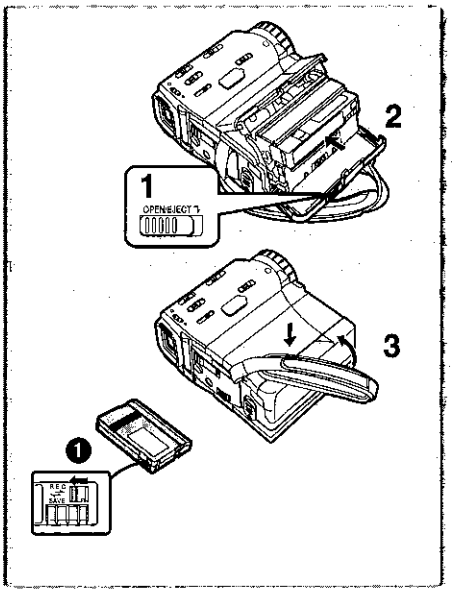


Adjusting the Grip Belt

Adjust the length of the Grip Belt to the size of your hand.

1 **Pass your hand through the Grip Belt and adjust its length.**
2 **Fold back the end of the Grip Belt to securely fasten the velcro tape closure.**

- The Grip Belt can also be adjusted in SD Camera Style.



Inserting a Cassette

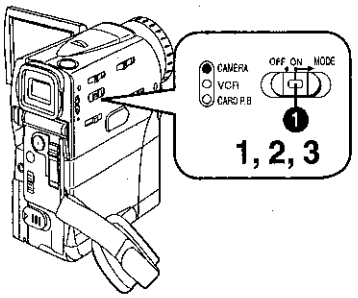
When power is supplied to the Movie Camera, the Cassette can be taken out without turning the Movie Camera on.

1 **Slide the [OPEN/EJECT] Lever to open the Cassette Compartment Cover.**
2 **Insert a Cassette.**
3 **Close the Cassette Compartment Covers to lock the Cover.**

Accidental Erasure Prevention

Opening the accidental erasure prevention slider ❶ on the cassette (by sliding it in the [SAVE] arrow direction) prevents recording. To enable recording, close the accidental erasure prevention slider (by sliding it in the [REC] arrow direction).

- For other notes concerning this item, see page 46.



Turning on the Movie Camera and Selecting Modes

Turn on the power first and then select modes.

How to Turn on the Power

1 Set the [OFF/ON/MODE] Switch to [ON] while pressing the centre Button ❶.

- The [CAMERA] Lamp lights up.

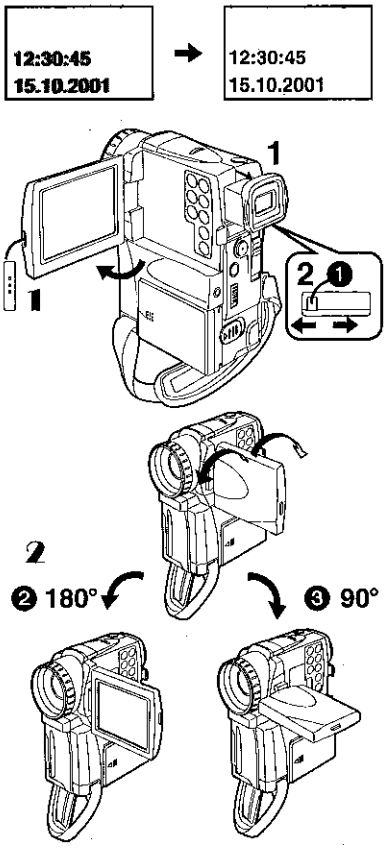
How to Switch Modes

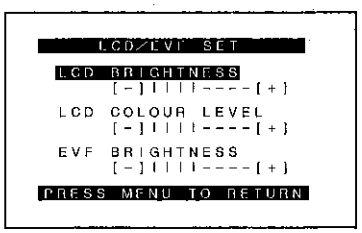
2 Slide the [OFF/ON/MODE] Switch to [MODE].

- With each slide of the switch, the Mode changes.
- The appropriate Mode Lamp lights up.

How to Turn off the Power

3 Set the [OFF/ON/MODE] Switch to [OFF] .





Using the Viewfinder/LCD Monitor

Using the Viewfinder

Before using the Viewfinder, adjust the field of view so that the displays inside the Viewfinder become clear and easy to read.

1 Slide the Viewfinder backward.

2 Adjust by sliding the Eyepiece Corrector Knob ❶.

Using the LCD Monitor

With the LCD Monitor open, you can also record the picture while watching it.

1 Press the [PUSH OPEN] Button and, at the same time, bring the LCD Monitor out about 90° in the direction of the arrow.

- The Viewfinder goes off.

2 Adjust the LCD Monitor angle according to the desired recording angle.

- The LCD Monitor can rotate a maximum of 180° ❷ from the vertical position to the upward direction and a maximum of 90° ❸ to the downward direction. Forcefully rotating the LCD Monitor beyond these ranges will damage the Movie Camera.

Closing the LCD Monitor

Push the LCD Monitor until the [PUSH OPEN] Button is securely locked.

Adjusting Brightness and Colour Level

When [LCD/EVF SET] on the [DISPLAY SETUP] Sub-Menu is set to [YES], the following items are displayed. (→ 13)

LCD Brightness [LCD BRIGHTNESS]

It adjusts the brightness of the image on the LCD screen.

LCD Colour Level [LCD COLOUR LEVEL]

It adjusts the colour saturation of the image on the LCD screen.

Viewfinder Brightness [EVF BRIGHTNESS]

It adjusts the brightness of the image in the Viewfinder.

To Adjust

Press the [PUSH] Dial and select the item to be adjusted, and then turn the [PUSH] Dial to raise or lower the number of vertical bars in the Bar Indication.

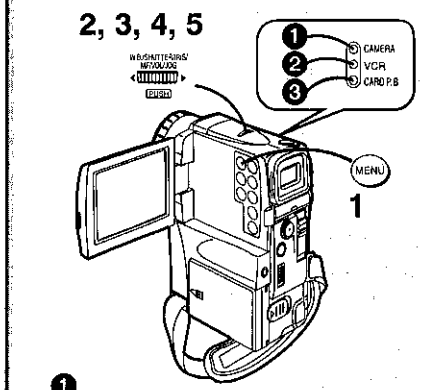
- A larger number of vertical bars indicates stronger brightness or colour saturation.

Increasing the Brightness of the Entire LCD Monitor

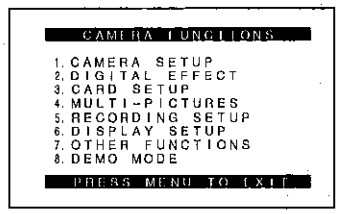
Set the [LCD MODE] on the [DISPLAY SETUP] Sub-Menu to [BRIGHT].

- These adjustments do not affect the recorded images.

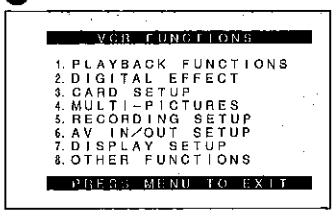
- For other notes concerning this item, see page 54.



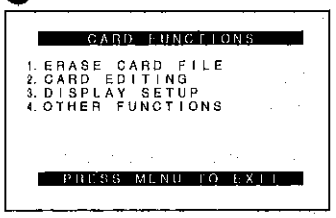
❶

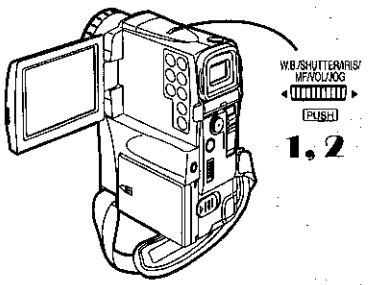


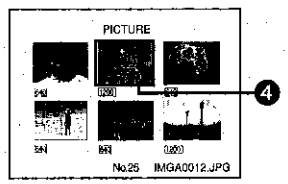
❷



❸







Using the Menu Screen

To facilitate the selection of a desired function or setup, this Movie Camera displays various function setups on Menus.

1 Press the [MENU] Button.

- When the [CAMERA] Lamp is on, the Camera Function Menu is displayed. ❶
- When the [VCR] Lamp is on, the VCR Function Menu is displayed. ❷
- When the [CARD P.B] Lamp is on, the Card Function Menu is displayed. ❸

2 Turn the [PUSH] Dial to select a desired Sub-Menu.

- Turn the [PUSH] Dial to display the highlightened item.

3 Press the [PUSH] Dial to display the selected Sub-Menu.

4 Turn the [PUSH] Dial to select the item to be set.

5 Press the [PUSH] Dial to set the selected item to a desired mode.

- With each press of the [PUSH] Dial, the cursor [▶] moves to the next mode. Menu items that cannot be used in combination with the selected item are displayed in dark blue.

- While a Menu is displayed, you cannot record or play back. Menus can be displayed during playback but not during recording. The above operations can be done using the [MENU] Button, [SET] Button and [ITEM] Button on the Remote Controller. **(➔ 8)**

To Exit the Menu Screen

Press the [MENU] Button again.

About the Menu Mode Setting

The setting selected on the Menu will be retained even when the Movie Camera is turned off. However, if the Battery or AC Adaptor is disconnected before turning off the Movie Camera, the selected setup may not be retained. (But, the setups of [EFFECT2] **(➔ 24)** are not retained.)

- Menu operation flow is shown in this text by >>.

■File Selection in the Card Playback Mode

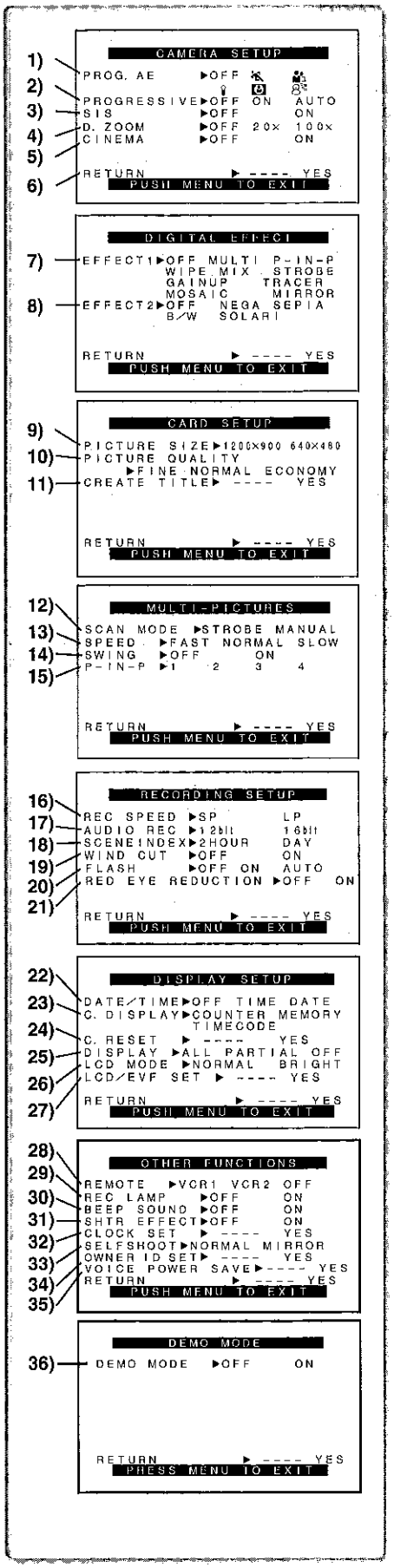
A File Selection Operation may be necessary during Menu Operations. In this case, carry out the following procedure.

1 Turn the [PUSH] Dial and select a File.

- The selected File is marked by a frame ❹.

2 Press the [PUSH] Dial to confirm the selection of the File.

- After the above File Selectioin Procedure, carry out the various Menu Operations. (The above procedure will not be repeated in the following instructions.)



List of Menus

The figures of the Menus are for explanation purposes only, and they are different from the actual Menus.

Camera Mode Main-Menu [CAMERA FUNCTIONS]

[CAMERA SETUP] Sub-Menu

1) Auto Exposure Mode [PROG.AE] **(➜ 21)**
2) Progressive Photoshot Mode [PROGRESSIVE] **(➜ 19)**
3) Image Stabilizer [SIS] **(➜ 20)**
4) Digital Zoom [D.ZOOM] **(➜ 20)**
5) Cinema-like Format Recording [CINEMA] **(➜ 21)**
6) Returning to the Main-Menu [RETURN]
   - If you set [RETURN] to [YES], the menu changes back to the Main-Menu.

[DIGITAL EFFECT] Sub-Menu

7) Digital Effects 1 [EFFECT1] **(➜ 24, 25)**
8) Digital Effects 2 [EFFECT2] **(➜ 24)**

[CARD SETUP] Sub-Menu

9) Picture Size [PICTURE SIZE] **(➜ 34)**
10) Picture Quality [PICTURE QUALITY] **(➜ 35)**
11) Title Creation [CREATE TITLE] **(➜ 40)**

[MULTI-PICTURES] Sub-Menu

12) Multi-Picture Mode [SCAN MODE] **(➜ 25)**
13) Strobe Multi-Picture Speed [SPEED] **(➜ 25)**
14) Swing Mode [SWING] **(➜ 25)**
15) Position of Small Picture inside Normal Picture [P-IN-P] **(➜ 25)**

[RECORDING SETUP] Sub-Menu

16) Recording Speed Mode [REC SPEED] **(➜ 17)**
17) Audio Recording Mode [AUDIO REC] **(➜ 17)**
18) Scene Index Mode [SCENEINDEX] **(➜ 28)**
19) Wind Noise Reduction [WIND CUT]
   - If you set [WIND CUT] to [ON], you can reduce the sound of wind hitting the microphone when recording.

20) Video Flash [FLASH] **(➜ 36)**
21) Red Eye Reduction [RED EYE REDUCTION] **(➜ 36)**

[DISPLAY SETUP] Sub-Menu

22) Date and Time Indication [DATE/TIME] **(➜ 45)**
23) Counter Display Mode [C.DISPLAY] **(➜ 45)**
24) Counter Reset [C.RESET] **(➜ 56)**
   - It resets the counter to zero. However, it cannot reset the Time Code.

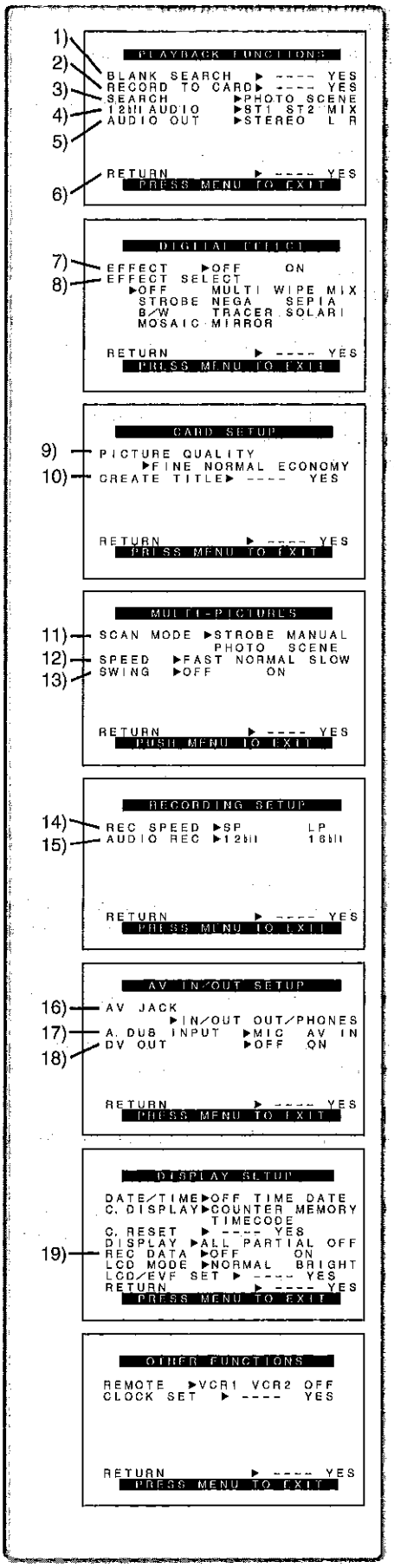
25) Display Mode [DISPLAY] **(➜ 45)**
26) LCD Lighting Mode [LCD MODE] **(➜ 12)**
27) LCD and Viewfinder Adjustment [LCD/EVF SET] **(➜ 12)**

[OTHER FUNCTIONS] Sub-Menu

28) Remote Controller Mode [REMOTE] **(➜ 9)**
29) Recording Lamp [REC LAMP] **(➜ 18)**
30) Beep Sound [BEEP SOUND] **(➜ 46)**
31) Shutter Effect [SHTR EFFECT] **(➜ 19)**
32) Date and Time Setting [CLOCK SET] **(➜ 17)**
33) Self-Recording [SELFSHOOT] **(➜ 18)**
34) Owner ID set [OWNER ID SET] **(➜ 45)**
35) Voice Power Save [VOICE POWER SAVE] **(➜ 50)**

[DEMO MODE] Sub-Menu

36) Demonstration Mode [DEMO MODE]
   - If no operation takes place for approximately 10 minutes after the AC Adaptor was connected to the Movie Camera and the [OFF/ON/MODE] Switch was turned to [ON] without inserting a Cassette and a Card, the Movie Camera is automatically set to Demonstration Mode for introducing its functions. If any button is pressed or operated, the Demonstration Mode is cancelled. The Demonstration Mode can be started by setting [DEMO MODE] to [ON] and by exiting the Menu. To terminate the Demonstration Mode, insert a Cassette or set the [DEMO MODE] to [OFF].



VCR Mode Main-Menu [VCR FUNCTIONS]

[PLAYBACK FUNCTIONS] Sub-Menu

1) Blank Search [BLANK SEARCH] **(➜ 27)**
2) Recording to Card [RECORD TO CARD] **(➜ 36)**
3) Index Search Mode [SEARCH] **(➜ 28)**
4) Audio Selector [12bit AUDIO] **(➜ 32)**
5) Audio Output Mode [AUDIO OUT] **(➜ 48)**
6) Returning to the Main-Menu [RETURN]

[DIGITAL EFFECT] Sub-Menu

7) Digital Effect On/Off [EFFECT] **(➜ 29)**
8) Digital Effect Selection [EFFECT SELECT] **(➜ 29)**

[CARD SETUP] Sub-Menu

9) Picture Quality [PICTURE QUALITY] **(➜ 35)**
10) Title Creation [CREATE TITLE] **(➜ 40)**

[MULTI-PICTURES] Sub-Menu

11) Multi-Picture Mode [SCAN MODE] **(➜ 30)**
12) Strobe Multi-Picture Speed [SPEED] **(➜ 30)**
13) Swing Mode [SWING] **(➜ 30)**

[RECORDING SETUP] Sub-Menu

14) Recording Speed Mode [REC SPEED] **(➜ 17)**
15) Audio Recording Mode [AUDIO REC] **(➜ 32)**

[AV IN/OUT SETUP] Sub-Menu

16) AV Socker [AV JACK] **(➜ 31, 32)**
17) Audio Dubbing Input [A.DUB INPUT] **(➜ 32)**
18) Analog-Digital Conversion Output [DV OUT] **(➜ 49)**

[DISPLAY SETUP] Sub-Menu

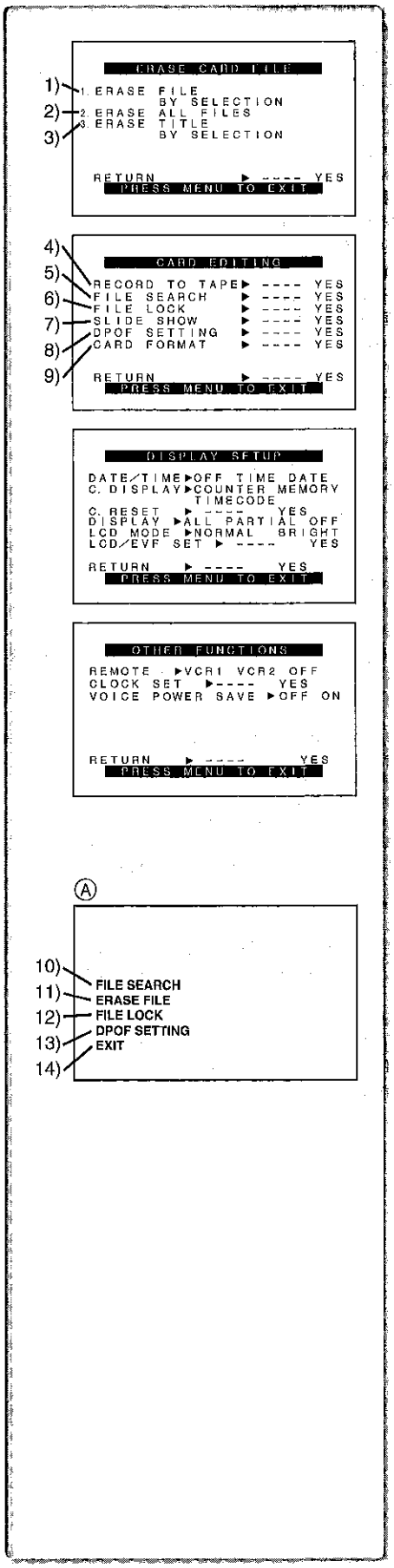
19) Camera Data [REC DATA]
- If you set [REC DATA] to [ON], the settings (shutter speed **(➜ 23)**, iris **(➜ 23)** and white balance settings **(➜ 22)**, etc.) used during the recordings are displayed during playback. [---] appears on the display when there is no data.
- The setting information may not displayed properly if the camera data of this Movie Camera are played back on other equipment.

The camera data will not be recorded in the following cases:
- When the data are recorded from a card to a tape.
- When recording proceeds with no input signals supplied.
- When recording involves the use of the S-Video or AV Input Socket.
- When pictures with no camera data are recorded using the DV Terminal.
- When displaying a list of titles.

All of the other items on the [DISPLAY SETUP] Sub-Menu are the same as those on the [DISPLAY SETUP] Sub-Menu of the [CAMERA FUNCTIONS] Main-Menu.

[OTHER FUNCTIONS] Sub-Menu

All of the items on the [OTHER FUNCTIONS] Sub-Menu are the same as those on the [OTHER FUNCTIONS] Sub-Menu of the [CAMERA FUNCTIONS] Main-Menu.



Card Playback Mode Main-Menu [CARD FUNCTIONS]

[ERASE CARD FILE] Sub-Menu

1) Selecting and Erasing a File [ERASE FILE BY SELECTION] **(➔ 41)**
2) Erasing All Files [ERASE ALL FILES] **(➔ 41)**
3) Selecting and Erasing a Title [ERASE TITLE BY SELECTION] **(➔ 41)**

[CARD EDITING] Sub-Menu

4) Recording to Tape [RECORD TO TAPE] **(➔ 38)**
5) Searching a File [FILE SEARCH] **(➔ 37)**
6) Setting the Lock [FILE LOCK] **(➔ 41)**
7) Setting a Slide Show [SLIDE SHOW] **(➔ 39)**
8) Setting DPOF [DPOF SETTING] **(➔ 42)**
9) Formatting a Card [CARD FORMAT] **(➔ 42)**

[DISPLAY SETUP] Sub-Menu

All of the items on the [DISPLAY SETUP] Sub-Menu are the same as those on the [DISPLAY SETUP] Sub-Menu of the [CAMERA FUNCTIONS] Main-Menu.

[OTHER FUNCTIONS] Sub-Menu

All of the items on the [OTHER FUNCTIONS] Sub-Menu are the same as those on the [OTHER FUNCTIONS] Sub-Menu of the [CAMERA FUNCTIONS] Main-Menu.

Short-Cut Menus of the Card Playback Mode Ⓐ

If you use the Short-Cut Menu, the Card Playback Mode Menu can be called up quickly. Press the [PUSH] Dial to display the Short-Cut Menu, and turn the [PUSH] Dial to select the desired Menu.

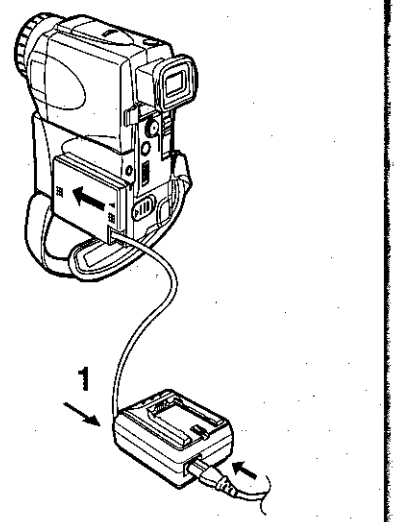
10) [FILE SEARCH]:
The [FILE SEARCH] Menu for finding Files by number appears. **(➔ 37)**

11) [ERASE FILE]:
The [ERASE FILE] Menu for erasing the File being displayed appears. **(➔ 41)** Use this Menu after the File to be erased appears.

12) [FILE LOCK]:
If you select [FILE LOCK], you can avoid accidental erasure of Files (Lock Setting **(➔ 41)**). Use this Short-Cut Menu after the File to be locked appears.

13) [DPOF SETTING]:
The [DPOF SETTING] Menu for setting DPOF to the File displayed appears. **(➔ 42)** Use this Menu after the File for DPOF Setting appears.

14) [EXIT]:
It is for terminating the Short-Cut Menu.



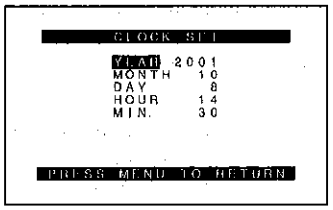
Internal Lithium Battery Recharge

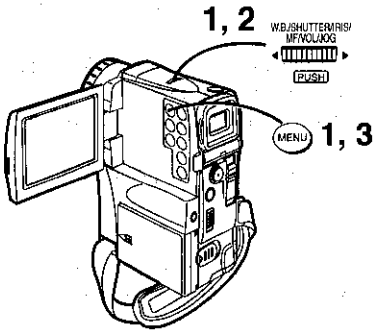
The internal lithium battery sustains the operation of the clock. When the [⊗] Indication is lit, the internal lithium battery is near exhaustion.

1 Connect the AC Adaptor to the Movie Camera with the power turned off and then connect to the AC Mains socket.

- After charging for 4 hours, the built-in lithium battery can power the clock for approximately 3 months.

WARNING
THE LITHIUM BATTERY IN THIS EQUIPMENT MUST ONLY BE REPLACED BY QUALIFIED PERSONNEL. WHEN NECESSARY, CONTACT YOUR LOCAL PANASONIC SUPPLIER.





❶

Setting Date and Time

Since the internal clock of the Movie Camera has a slight imprecision, make sure to check the time before recording.

1 Set [OTHER FUNCTIONS] >> [CLOCK SET] >> [YES].

2 Press the [PUSH] Dial to select [YEAR]/[MONTH]/[DAY]/[HOUR]/[MIN.] and turn to set it to a desired value.

- Year will cycle in the order shown below.
  2000, 2001, ..., 2089, 2000, ...

3 Press the [MENU] Button to finish setting the date and time.

- The clock operation starts from [00] second.

- It is possible that the built-in clock in the Movie Camera may become inaccurate. Please check the time before recording. If the [⊗] Indication ❶ is flashing, charge the built-in lithium battery and reset the date and time.
- The clock employs the 24-hour system.

LP Mode

A desired recording speed can be selected with [REC SPEED] on the [RECORDING SETUP] Sub-Menu. (When recording to tape only)

If LP Mode is selected, the recording time becomes 1.5 times longer than that of SP Mode.

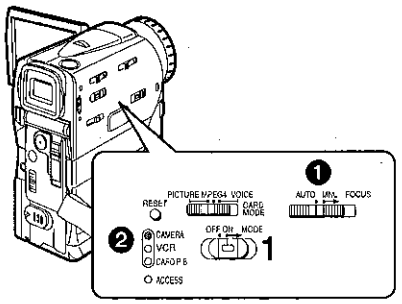
Although the image quality does not decrease with the LP Mode recording, mosaic-pattern noise may appear on a playback image, or some normal functions may be restricted.

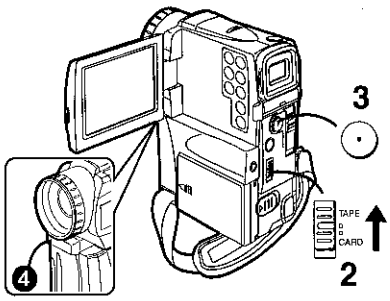
- The contents that are recorded in LP Mode are not completely compatible with other equipment.
- Audio dubbing is not possible with LP Mode. **(➔ 32)**

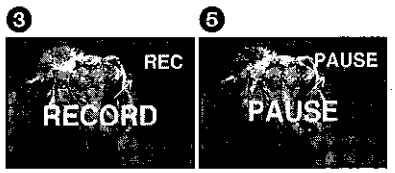
Audio Recording Mode

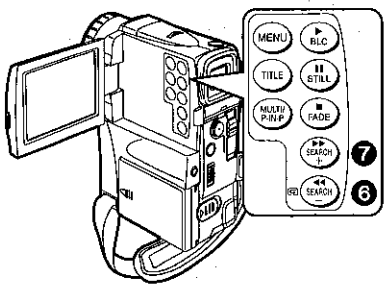
The sound quality of the recorded sound can be selected with [AUDIO REC] on the [RECORDING SETUP] Sub-Menu.

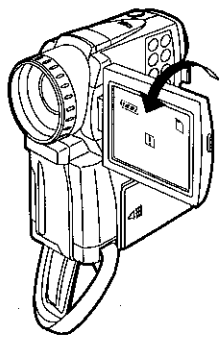
High sound-quality recording is possible with "16 bit 48 kHz 2 track" Mode. With the "12 bit 32 kHz 4 track" Mode, the original sound can be recorded on 2 tracks in stereo, while the other 2 tracks can be used for Audio Dubbing.

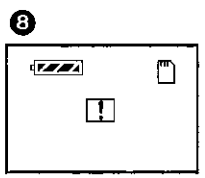












CAMERA Mode

Recording

When recording with the Mode Selector Switch ❶ set to [AUTO], the Movie Camera automatically adjust the focus and white balance. In some cases, they cannot be adjusted automatically and need to be adjusted manually.
(➔ 22, 23)

1 Set the [OFF/ON/MODE] Switch to [ON].
- The [CAMERA] Lamp lights up. ❷

2 Slide the [TAPE/CARD] Selector towards [TAPE].

3 Press the Recording Start/Stop Button.
- Recording starts.
- After the [RECORD] is displayed, it changes to [REC]. ❸

■Recording Lamp (Tally Lamp) ❹

The Recording Lamp lights up during recording and alerts those being recorded that recording is in progress.
- The Recording Lamp does not light up if the [REC LAMP] on the [OTHER FUNCTIONS] Sub-Menu is set to [OFF].

■To Pause the Recording

Press the Recording Start/Stop Button again.
The [PAUSE] Indication is displayed. ❺
- If the Recording Pause Mode continues for more than 6 minutes, the power is turned off automatically for tape protection and power conservation. To resume recording from this condition, turn on the power again.

■To Check the Recording

By pressing the [⏪] Button ❻ briefly in the Recording Pause Mode, you can play back the last few seconds of the recorded scene.
- The [CHK] Indication is displayed. After checking, the Movie Camera resumes the Recording Pause Mode.

■To View the Recorded Scene while the Recording Is Paused (Camera Search)

The recorded scene can be viewed by keep pressing the [−SEARCH] Button ❻ or [SEARCH+] Button ❼ in the Recording Pause Mode.
- When the [−SEARCH] Button is pressed, images are played back in the reverse direction.
- When the [SEARCH+] Button is pressed, images are played back in the forward direction.

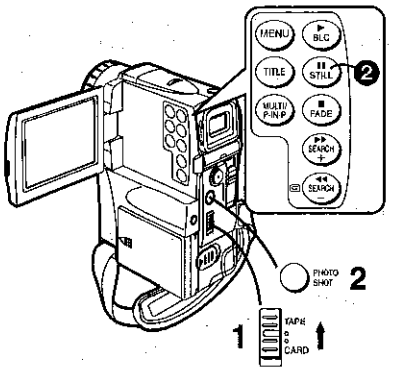
■Recording Yourself

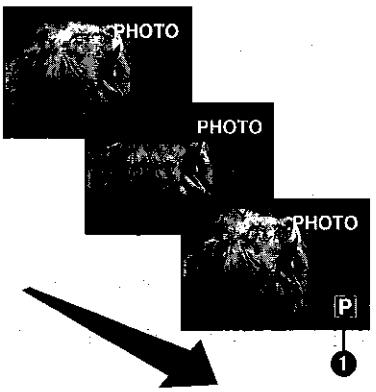
By opening the LCD Monitor and rotating it frontward (to the lens side), you can let the subject in front of the Movie Camera monitor the shot while recording is in progress.
- Opening the LCD Monitor automatically turns off the Viewfinder. However, when you turn the LCD Monitor forward, the picture also appears in the Viewfinder.
- If you prefer to have the image on the LCD Monitor to look like an image in a mirror, set [SELFSHOOT] on the [OTHER FUNCTIONS] sub-Menu to [MIRROR].
  Images are recorded normally and no left and right reversal occurs.
- If [MIRROR] is used during self-recording, only the basic indications, such as the Recording Indication [⏺] (Red), Recording Pause Indication [⏸] (Cyan) and Remaining Battery Power Indication [▰▰▰], are displayed. ❽
- If a general Warning/Alarm Indication [⚠] appears, return the LCD Monitor to the original position in order to check the specific content of the Warning/Alarm Indication.

■To Finish the Recording

Set the [OFF/ON/MODE] Switch to [OFF].

- For other notes concerning this item, see page 46.





Photoshot

This Movie Camera can take approximately 7 seconds still pictures containing sound.

1 **Slide the [TAPE/CARD] Selector towards [TAPE].**

2 **Press the [PHOTO SHOT] Button in the Recording Pause Mode.**

- The Movie Camera records a still picture for about 7 seconds and then switches back to the Recording Pause Mode.

■Progressive Photoshot

With the Progressive Photoshot Function, you can record still pictures with higher resolution than with the normal Photoshot Function.

- When [PROGRESSIVE] on the [CAMERA SETUP] Sub-Menu is set to [ON] or [AUTO], the [P] Indication ❶ is displayed. When the [P] Indication is displayed, press the [PHOTO SHOT] Button in the Recording Pause Mode.
- This function may not work with some function setups.

■Continuous Photoshot

If you set [SHTR EFFECT] on the [OTHER FUNCTIONS] Sub-Menu to [ON] and keep the [PHOTO SHOT] Button pressed, the Movie Camera will continuously record still pictures in approximately 0.7 seconds intervals until the button is released. (However, this does not operate when using Progressive Photoshot.)

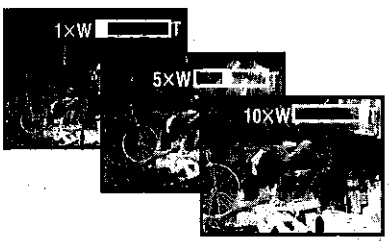
- The screen blinks and, at the same time, a shutter clicking sound is recorded.

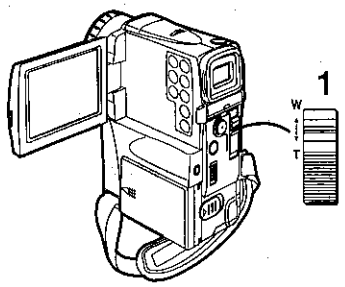
■Digital Still Picture

When the [STILL] Button ❷ is pressed, images become still pictures. When the button is pressed again, the Digital Still Picture Mode is cancelled.

- We recommend that you press the [STILL] Button first at the position where you want to record the picture so as to enter the Digital Still Picture Mode and then press the [PHOTO SHOT] Button.

- For other notes concerning this item, see page 46.





Zoom In/Out Functions

It gives special effects to the video by recording objects close by or with wide-angle shot.

1 **For wide-angle shots (zoom out):**
Push the [W/T] Zoom Lever towards [W].
For close-ups (zoom in):
Push the [W/T] Zoom Lever towards [T].

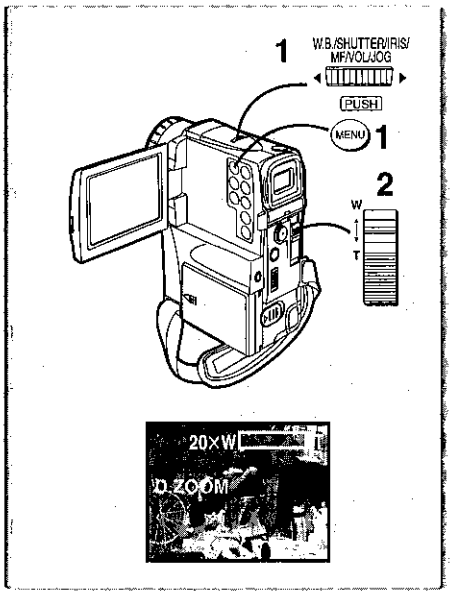
- Zoom Magnification Indication is displayed for a few seconds.

To Take Close-up Shots of Small Subjects

(Macro Close-up Function)

When the zoom magnification is 1×, the Movie Camera can focus on a subject that is as close as approximately 35 mm from the Lens. With this, small subjects like insects can be recorded.

- For other notes concerning this item, see page 46.



Digital Zoom Function

This function is useful when you want to record close-up shots of subjects located beyond a normal zoom range of 1× to 10× magnification. With the Digital Zoom Function, you can select a magnification of 20× or even to 100×.

1 Set [CAMERA FUNCTIONS] >> [CAMERA SETUP] >> [D.ZOOM] >> [20×] or [100×].

- 20×: Digital zooming to 20×
- 100×: Digital zooming to 100×

2 Push the [W/T] Zoom Lever towards [W] or towards [T] to zoom in or out.

To Cancel the Digital Zoom Function

Set [D.ZOOM] on the [CAMERA SETUP] Sub-Menu to [OFF].

- As the magnification of digital zoom increases, the quality of image may deteriorate.
- White balance cannot be set in the digital zoom range.

- For other notes concerning this item, see page 46.

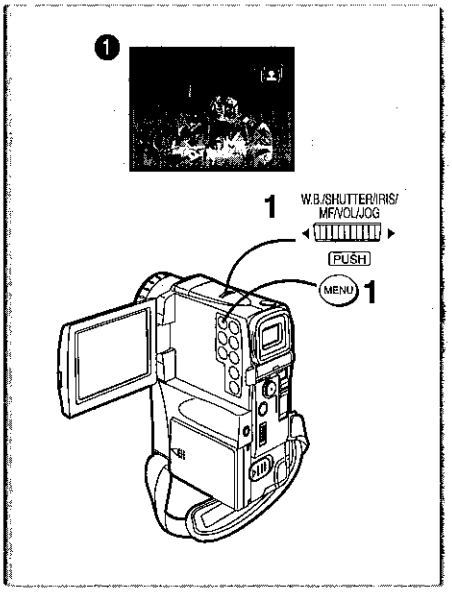


Image Stabilizer Function

If the Movie Camera might be shaken while recording, you can use this function to stabilize the image.

- If the Movie Camera shakes too much, this function may not be able to stabilize images.

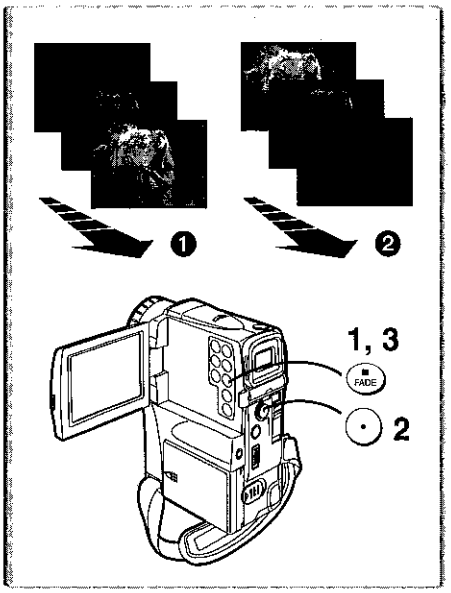
1 Set [CAMERA FUNCTIONS] >> [CAMERA SETUP] >> [SIS] >> [ON].

- The [ ] Indication ❶ appears.

To Cancel Image Stabilizer

Set [SIS] on the [CAMERA SETUP] sub-Menu to [OFF].

- For other notes concerning this item, see page 46.



Fade In/Out Functions

Fade In ❶

Fade In brings out images and sounds gradually from a black screen at the beginning of a scene.

1 Keep pressing the [FADE] Button during the Recording Pause Mode.

- The image fades out gradually.

2 When the image is completely gone, press the Recording Start/Stop Button to start recording.

3 Release the [FADE] Button about 3 seconds after starting recording.

- The image reappears gradually.

Fade Out ❷

Fade Out causes images and sounds to disappear gradually, leaving a black screen at the end of a scene.

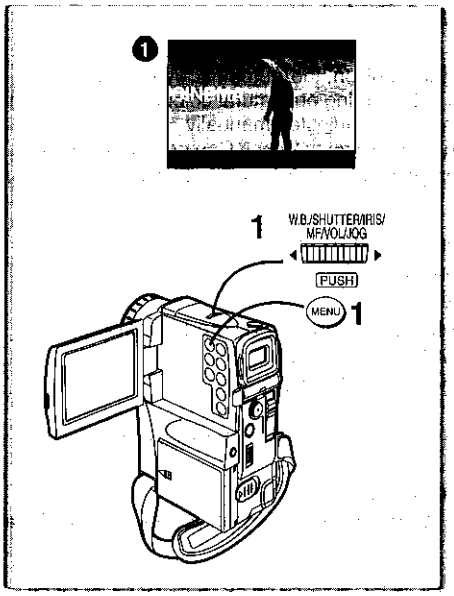
1 Keep pressing the [FADE] Button while recording.

- The image fades out gradually.

2 When the image is completely gone, press the Recording Start/Stop Button to stop recording.

3 Release the [FADE] Button.

- Fade in/out function cannot be used in MPEG4 Recording Mode (➔ 35), Photoshot Recording Mode, Still Picture Mode (➔ 25).



Cinema Function

This function is for recording in a cinema-like wide screen.

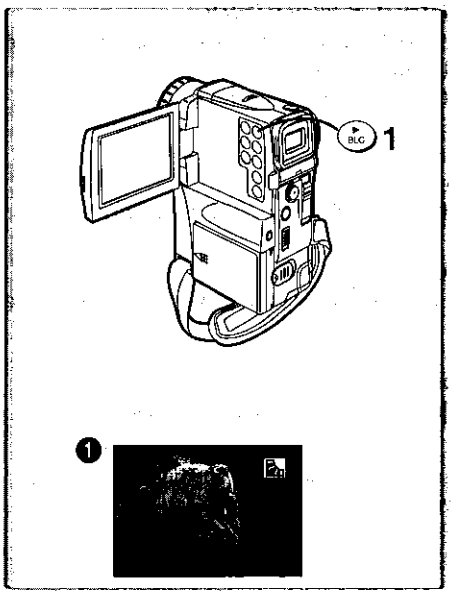
1 Set [CAMERA FUNCTIONS] >> [CAMERA SETUP] >> [CINEMA] >> [ON].

- Black bars appear at the top and bottom of the screen. ❶

To Cancel the Cinema Mode

Set [CAMERA FUNCTIONS] >> [CAMERA SETUP] >> [CINEMA] >> [OFF].

- For other notes concerning this item, see page 46.



Backlight Compensation Function

This prevents a recording subject from being recorded darker in backlight. (Backlight is the light that shines from behind a recording subject.)

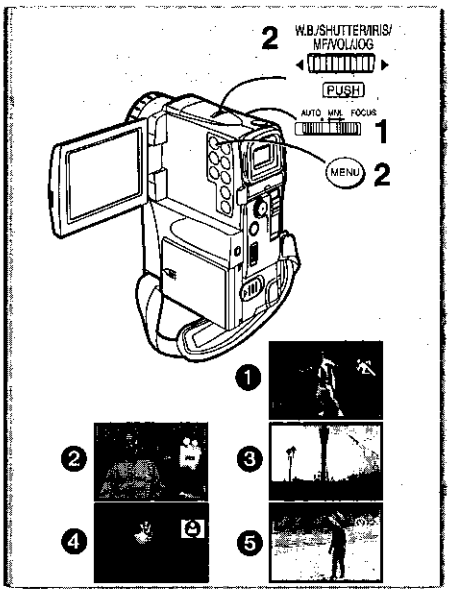
1 Press the [BLC] Button.

- The [BLC] Indication ❶ flashes and then is displayed.

To Resume Normal Recording

Press the [BLC] Button.

- When the [BLC] Button is pressed, the entire screen becomes brighter.
- By operating the [OFF/ON/MODE] Switch, the Backlight Compensation Function is cancelled.
- This function cannot be used when the Iris is set.



Recording in Special Situations

(Programme AE)

You can select optimal automatic exposures under specific recording situations.

1 Set the Mode Selector Switch to [MNL].

- The [MNL] Indication appears.

2 Set [CAMERA FUNCTIONS] >> [CAMERA SETUP] >> [PROG.AE] >> a desired Mode [ ], [ ], [ ], [ ], [ ].

- The Indication for the selected mode appears.

[ ] Sports Mode ❶

For recording scenes involving quick movements, such as sports scenes.

[ ] Portrait Mode ❷

For bringing up people clearly from the background.

[ ] Low Light Mode ❸

For recording a dark scene brighter.

[ ] Spotlight Mode ❹

For recording a subject under spotlight in a party, theatre, etc.

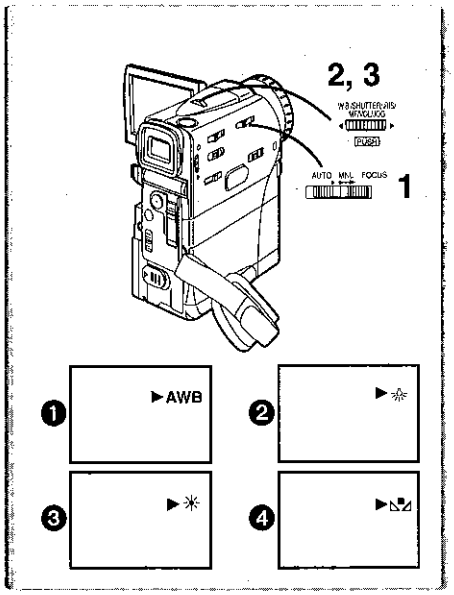
[ ] Surf & Snow Mode ❺

For recording in a glaring surrounding, such as skiing grounds, beaches, etc.

To Cancel the Programme AE Function

Set [PROG.AE] on the [CAMERA SETUP] Sub-Menu to [OFF]. Or, set the Mode Selector Switch to [AUTO].

- For other notes concerning this item, see page 47.



Recording in Natural Colours

(White Balance)

Depending on the scene or light condition, the Automatic White Balance Adjustment Mode may not be able to bring out natural colours. **(➔ 22, 56)** In such a case, the white balance can be adjusted manually.

When the Movie Camera is turned on with the Lens Cap on, the automatic white balance may not work properly. Please turn on the Movie Camera after removing the cap.

1 Set the Mode Selector Switch to [MNL].

- The [MNL] Indication appears.

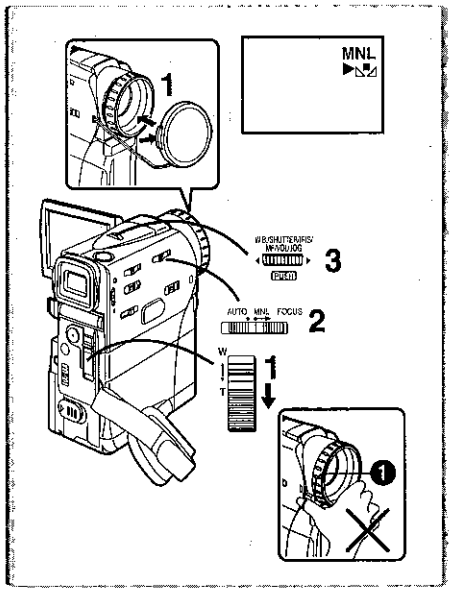
2 Press the [PUSH] Dial.

3 Turn the [PUSH] Dial to set a desired White Balance Mode.

❶ Automatic White Balance Adjustment [AWB]
❷ Indoor Mode (recording under incandescent lamp) [☼]
❸ Outdoor Mode [☀]
❹ The white balalnce setting that was previously set manually [▪◿]

To Resume Automatic Adjustment

Turn the [PUSH] Dial until the [AWB] Indication is displayed. Or, set the Mode Selector Switch to [AUTO].



Adjusting White Balance Manually

For light outside the functional Auto White Balance Adjustment range 1), use the Manual White Balance Adjustment Mode.

1 Attach the Lens Cap and zoom in until the entire screen becomes white.

2 Set the Mode Selector Switch to [MNL].

- The [MNL] Indication appears.

3 Keep pressing [PUSH] Dial until the [▪◿] Indication stops flashing.

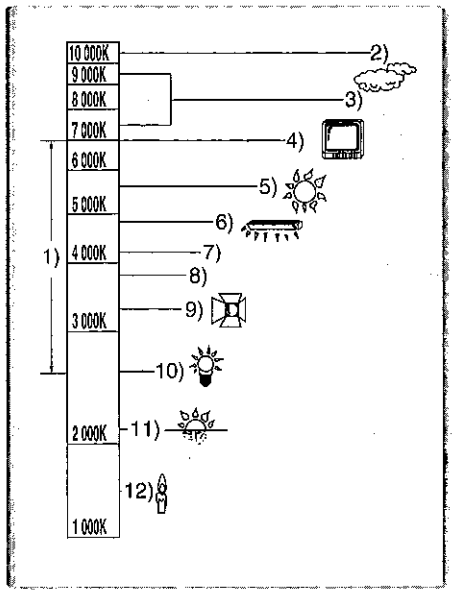
To Resume Automatic Adjustment

Turn the [PUSH] Dial until the [AWB] Indication is displayed. Or, set the Mode Selector Switch to [AUTO].

■About White Balance Sensor

The White Balance Sensor ❶ determines the nature of the light source during recording.

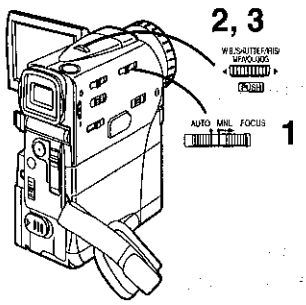
- Do not cover the White Balance Sensor with your hand during recording. Otherwise, White Balance will not function normally.

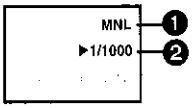


Outside of the effective range of Automatic White Balance Adjustment, the image will become reddish or bluish. Even within the effective range of Automatic White Balance Adjustment, the Automatic White Balance Adjustment may not function properly if there is more than one light source. In this case, adjust the White Balance.

1) The effective range of Automatic White Balance Adjustment on this Movie Camera
2) Blue sky
3) Cloudy sky (Rain)
4) TV screen
5) Sunlight
6) White fluorescent lamp
7) 2 hour after sunrise or before sunset
8) 1 hour after sunrise or before sunset
9) Halogen light bulb
10) Incandescent light bulb
11) Sunrise or sunset
12) Candlelight

- For other notes concerning this item, see page 47.





Manual Shutter Speed Adjustment

It is useful for recording fast-moving subjects.

1 Set the Mode Selector Switch to [MNL].

- The [MNL] Indication ❶ appears.

2 Press the [PUSH] Dial until the Shutter Speed Indication ❷ appears.

3 Turn the [PUSH] Dial to adjust the shutter speed.

Range of Shutter Speed Adjustment

1/50–1/8000 s (or 1/25-1/500 : for Mega Pixel Recording)

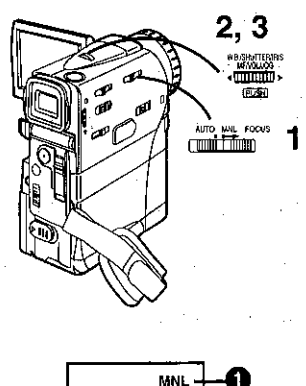
The standard shutter speed is 1/50 s.

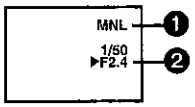
Selecting a speed closer to [1/8000] causes the shutter speed to be faster.

To Resume Automatic Adjustment

Set the Mode Selector Switch to [AUTO].

- For other notes concerning this item, see page 47.





Manual Iris Adjustment

(F Number)

You can use this function when the screen is too bright or too dark.

1 Set the Mode Selector Switch to [MNL].

- The [MNL] Indication ❶ appears.

2 Press the [PUSH] Dial until the Iris Indication ❷ appears.

3 Turn the [PUSH] Dial to adjust the Iris.

Range of Iris Adjustment

CLOSE (Closed), F16, ..., F2.0, OP (Opened)+0dB, ..., OP+18dB

When a value closer to [CLOSE] is selected, the image becomes darker.

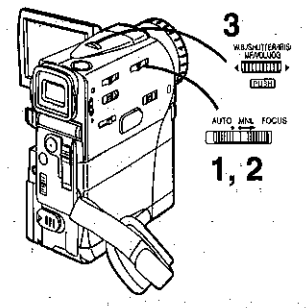
When a value closer to [OP+18dB] is selected, the image becomes brighter.

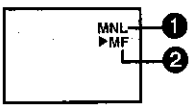
The value to which +dB is attached indicates a Gain-up value. If this value is too large, the quality of the Image deteriorates.

To Resume Automatic Adjustment

Set the Mode Selector Switch to [AUTO].

- For other notes concerning this item, see page 47.





Manual Focus Adjustment

Focus can be adjusted manually for recording in a situation where auto focus may not function well.

1 Set the Mode Selector Switch to [MNL].

- The [MNL] Indication ❶ appears.

2 Slide the Mode Selector Switch to [FOCUS].

- The [▶MF] Indication (Manual Focus Mode) ❷ appears.

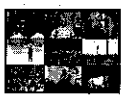
3 Turn the [PUSH] Dial to adjust the focus.

To Resume Automatic Adjustment

Set the Mode Selector Switch to [AUTO].

[EFFECT 1]

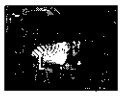
1) MULTI



2) P-IN-P

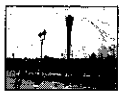
3) WIPE

4) MIX

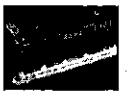


5) STROBE

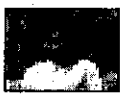
6) GAINUP



7) TRACER



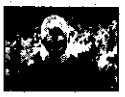
8) MOSAIC



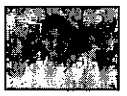
9) MIRROR

[EFFECT 2]

10) NEGA



11) SEPIA



12) B/W

13) SOLARI

Digital Effect Functions

This Movie Camera is equipped with Digital Effect Functions that add special effects to the scene.

Digital Effects 1 [EFFECT1]

1) Multi-Picture Mode [MULTI] **(➔ 25)**
2) Picture-in-Picture Mode [P-IN-P] **(➔ 25)**
3) Wipe Mode [WIPE] **(➔ 24)**
4) Mix Mode [MIX] **(➔ 24)**
5) Strobe Mode [STROBE]
   - It records images with a stroboscopic effect.
6) Gain-up Mode [GAINUP]
   - It brightens images electronically.
   - Adjust focus manually **(➔ 23)** when using this mode.
7) Trailing Effect Mode [TRACER]
   - It records images with a trailing effect.
8) Mosaic Mode [MOSAIC]
   - It produces a mosaic-like image.
9) Mirror Mode [MIRROR]
   - The right half of an image becomes a mirror image of the left half.

Digital Effects 2 [EFFECT2]

10) Negative Mode [NEGA]
    - The colours of the recorded image are inverted as seen in a negative.
11) Sepia Mode [SEPIA]
    - It records a scene with a brownish tint, like the colour of old pictures.
12) Black & White Mode [B/W]
    - It records an image in black and white.
13) Solarisation Mode [SOLARI]
    - It records an image with a painting-like effect.

To Select a Desired Digital Effect

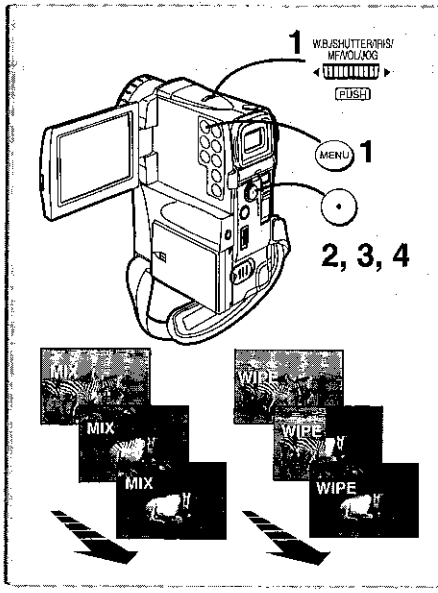
Set [CAMERA FUNCTIONS] >> [DIGITAL EFFECT] >> [EFFECT1] or [EFFECT2] >> a desired Digital Effect.

To Cancel the Digital Effect

Set [CAMERA FUNCTIONS] >> [DIGITAL EFFECT] >> [EFFECT1] or [EFFECT2] >> [OFF].

- If the Movie Camera is turned off, the [EFFECT2] settings are cancelled.

- For other notes concerning this item, see page 48.



■ Wipe Mode and Mix Mode

Wipe Mode:

Like a curtain is being pulled, the still picture of the last recorded scene gradually changes to the moving image of a new scene.

Mix Mode:

While the moving image of a new scene fades in, the still image of the last recorded scene gradually fades out.

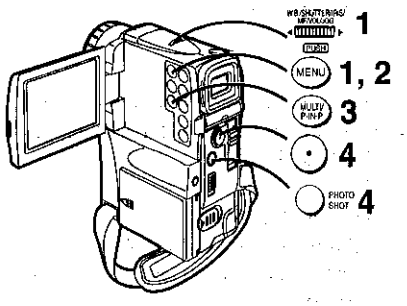
1 Set [DIGITAL EFFECT] >> [EFFECT1] >> [WIPE] or [MIX].
- The [WIPE] or [MIX] Indication appears.

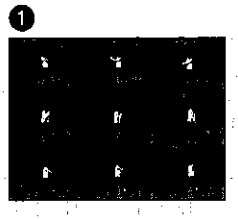
2 Press the Recording Start/Stop Button to start recording.

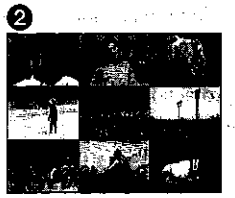
3 Press the Recording Start/Stop Button to pause the recording.
- The last scene is stored in memory. The [WIPE] or [MIX] Indication changes to [WIPE] or [MIX].

4 Press the Recording Start/Stop Button to restart the recording.
- The last image of the previous scene gradually changes to the new scene.

- For other notes concerning this item, see page 48.







■Multi-Picture Mode

Strobe Multi-Picture Mode ❶:
You can capture and record 9 consecutive small still pictures.
Manual Multi-Picture Mode ❷:
You can manually capture and record 9 small still pictures.

After setting [DIGITAL EFFECT] >> [EFFECT1] >> [MULTI].....

1 Set [MULTI-PICTURES] >> [SCAN MODE] >> [STROBE] or [MANUAL].

When [STROBE] is selected:

- Set the [SPEED] to the desired strobe speed.
  - **[FAST]:** You can capture 9 consecutive still pictures within approximately 1 second
  - **[NORMAL]:** You can capture 9 consecutive still pictures within approximately 2 seconds
  - **[SLOW]:** You can capture 9 consecutive still pictures within approximately 3 seconds
- If you set [SWING] on the [MULTI-PICTURES] Sub-Menu to [ON], the intervals at which the 9 still pictures are taken are longer at the beginning and end than in the middle of the swing strobe period, and it is useful for analyzing swing motion, etc., in sports.

2 Exit the menu by pressing the [MENU] Button.

3 Press the [MULTI] Button.

- If [MANUAL] is selected, press the [MULTI] Button at each scene you want to capture.

4 Press the Recording Start/Stop Button or the [PHOTO SHOT] Button to record on the Cassette.

Deleting all the captured Multi pictures

While 9 multi-pictures are displayed, press the [MULTI] Button.

- If [MANUAL] has been selected, press the [MULTI] Button after 9 pictures are displayed.

To Display the Multi Pictures again

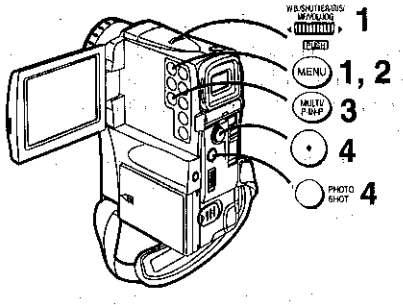
Press the [MULTI] Button for 1 second or longer.

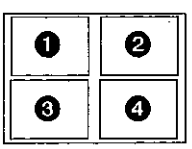
To Delete Multi pictures one by one (When pictures were captured in [MANUAL])

When the [MULTI] Button is pressed for 1 second or longer while the still pictures are displayed, the picture captured last is deleted. If you keep pressing the [MULTI] Button, the pictures are deleted continuously.

- After the still pictures have been individually deleted, they cannot be displayed again.

- For other notes, see page 48.





■Picture-in-Picture Mode

You can display a sub-screen (still picture) inside the screen.

After setting [DIGITAL EFFECT] >> [EFFECT1] >> [P-IN-P].....

1 Select [P-IN-P] on the [MULTI-PICTURES] Sub-Menu and set the position (❶,❷,❸ or ❹) where you want to insert a small still picture.

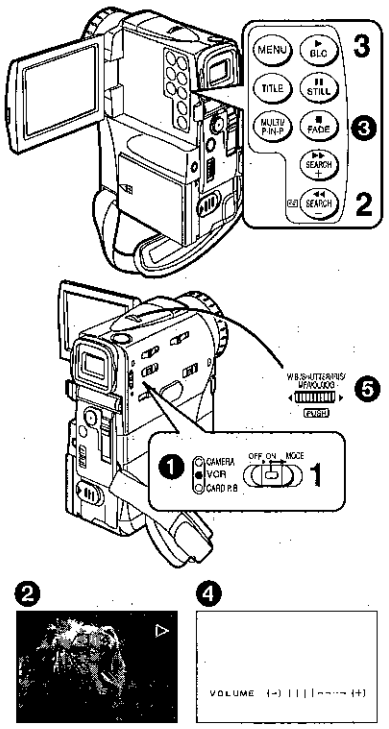
2 Exit the menu by pressing the [MENU] Button.

3 Aim the Movie Camera at the scene you want to capture and press the [P-IN-P] Button to insert a small still picture.

- A small still picture is displayed in a normal picture.
- If the [P-IN-P] Button is pressed again, the small still picture is cleared.

4 Press the Recording Start/Stop Button or the [PHOTO SHOT] Button to record on the Cassette.

- For other notes, see page 48.



VCR Mode

Playing Back

The recorded scene can be played back immediately after the recording.

1 Slide the [OFF/ON/MODE] Selector Switch to [MODE] and set the Movie Camera to the VCR Mode.

- The [VCR] Lamp lights up. ❶

2 Press the [◀◀] Button to rewind the tape.

- Rewind the tape to the point where you want to start playback.
- When the tape reaches the beginning, rewinding stops automatically.

3 Press the [▶] Button to start playback.

- The [▷] Indication ❷ appears.

To Stop Playback

Press the [■] Button. ❸

■Adjusting the Sound Volume

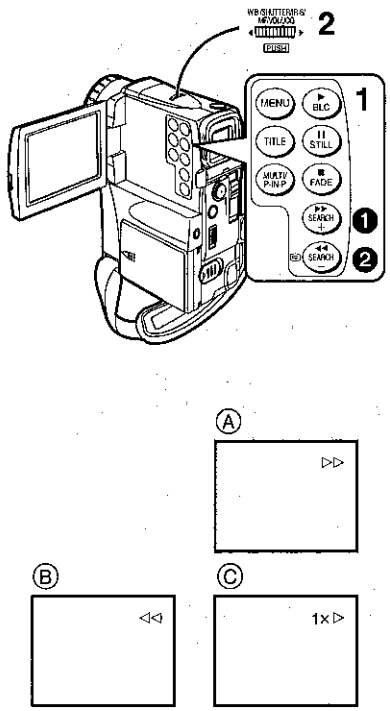
Until the [VOLUME] Indication ❹ appears, keep pressing the [PUSH] Dial ❺. Then, turn the [PUSH] Dial to adjust the volume. After the adjustment, press the [PUSH] Dial to make the [VOLUME] Indication disappear.

To adjust the volume with the Remote Controller, press the [T] or [W] Button to display the [VOLUME] Indication. Press the [T] Button to increase the volume or press the [W] Button to decrease the volume. The [VOLUME] Indication goes off a few seconds after the adjustment is finished.

- The sound volume cannot be adjusted using the Remote Controller in Playback Zoom Mode (➔ 29).

- If a cassette recorded with a copyright protection signal is played back, the picture is distorted by mosaic-like patterns.

- For other notes concerning this item, see page 48.



Finding a Scene You Want to Play Back

■Cue/Review Playback

If the [▶▶] Button ❶ or [◀◀] Button ❷ is pressed during Playback, it turns to Cue Playback Ⓐ or Review Playback Ⓑ.

- If the Button is held continuously, it turns to Cue Playback or Review Playback until you release it.
- If the Button is just pressed, Cue Playback or Review Playback continues even when it is released.

■Variable Speed Search Function ©

The speed of Cue Playback or Review Playback can be varied.

1 During playback, press the [▶] Button.

- [1×▷] Indication appears.

2 Turn the [PUSH] Dial to select a desired search speed.

The following 6 playback speeds are available for the Variable Speed Search Function in both the fast-forwarding and rewinding directions:

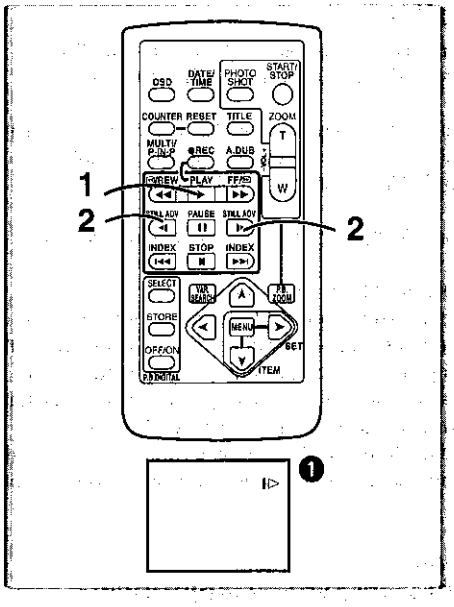
1/5× (slow playback in SP Mode only), 1/3× (slow playback in LP Mode only), 1×, 2×, 5×, 10× and 20×.

- The same setting can be performed using the Remote Controller's [VAR.SEARCH] Button, the [▲] Button and the [▼] Button.

■To Resume Normal Playback

Press the [▶] Button.

- During Cue or Review Playback, fast-moving images may show mosaic-pattern noise.
- The sound is muted during search.



Slow Motion Playback

This Movie Camera can play back at a slow speed.

1 Press the [▶] Button.

2 Press the [◀I] Button or [I▶] Button on the Remote Controller.

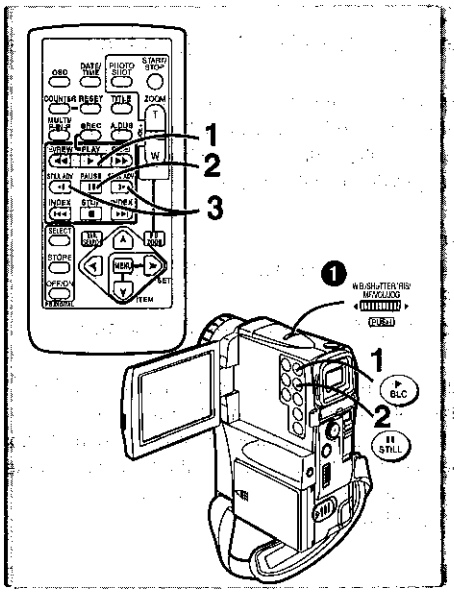
- The [I▷] or [◁I] Indication appears. ❶
- When the [◀I] Button is pressed, Slow Motion Playback proceeds in the reverse direction, while pressing the [I▶] Button starts Slow Motion Playback in the forward direction.

Scenes recorded in the SP Mode are played back at approximately 1/5th of the normal speed.

Scenes recorded in the LP Mode are played back at approximately 1/3rd of the normal speed.

To Resume Normal Playback

Press the [▶] Button.



Still Playback/Still Advance Playback

This Movie Camera is capable of still picture playback and frame-advance playback.

1 Press the [▶] Button.

2 Press the [❚❚] Button.

- The playback image stops in the Still Playback Mode.

3 Press the [◀I] Button or [I▶] Button on the Remote Controller.

- With each pressing of the [◀I] Button, still pictures advance in the reverse direction. With each pressing of the [I▶] Button, still pictures advances in the forward direction. If either one of the buttons continues to be pressed in the still playback Mode, still pictures advance continuously 1 frame at a time until the button is released.

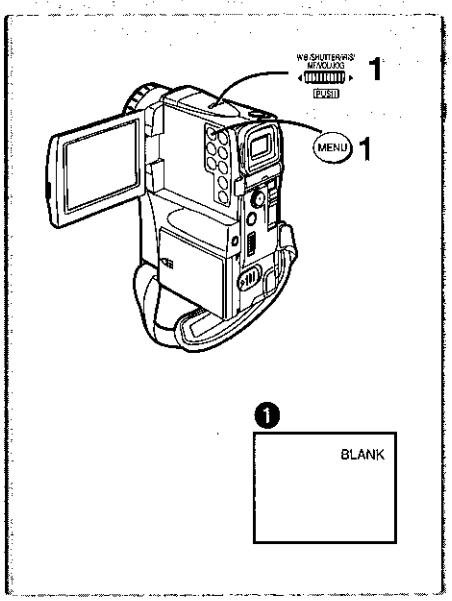
To Resume Normal Playback

Press the [▶] Button.

■Jog Playback

By turning the Jog Dial ([PUSH] Dial) ❶ of the Movie Camera in the Still Playback Mode, still pictures can be advanced one frame at a time in the forward or backward direction.

- If the Movie Camera is left in the Still Playback Mode for more than 6 minutes, the Movie Camera switches to the Stop Mode to protect the video heads from excessive wear and tear.



Finding the End of Recording

(Blank Search Function)

The Blank Search Function aids you locate the end of the recording on the Cassette quickly. (or a blank part between recordings)

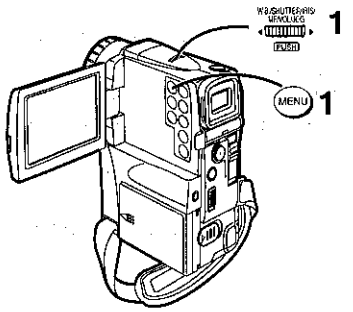
1 Set [VCR FUNCTIONS] >> [PLAYBACK FUNCTIONS] >> [BLANK SEARCH] >> [YES].

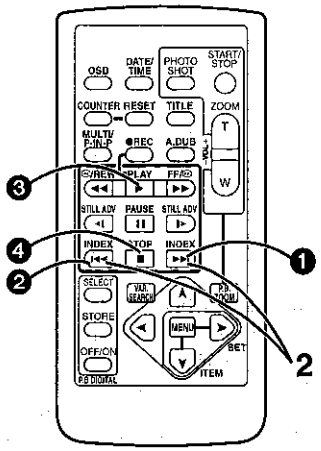
- The [BLANK] Indication appears ❶ during the Blank Search.
- Approximately 1 second before the last recorded scene, the Movie Camera switches to the Still Playback Mode.
- If there is no blank portion left on the Cassette, the Movie Camera stops at the end of the tape.

To Cancel Blank Search Before Completion

Press the [■] Button.

VCR





Ⓐ

INDEX

Ⓑ

S 1

Index Search Functions

To facilitate searching of desired scene, this Movie Camera automatically records index signals during recording, as explained in the following.

Photoshot Index Signal

These signals are automatically recorded whenever still pictures are taken in Photoshot Mode **(➔ 19)** on the tape. Photoshot Index Signals are not recorded on still pictures recorded in Continuous Photoshot Mode.

Scene Index Signal

Scene Index Signals are automatically recorded when you start recording after inserting a Cassette.

- If [SCENEINDEX] of [RECORDING SETUP] Sub-Menu on the [CAMERA FUNCTIONS] Main-Menu is set to [2HOUR], an index signal is recorded when recording is restarted after an elapse of 2 hours or longer. If it is set to [DAY], an index signal is recorded when recording is restarted after the date has changed since the last recording. (While the index signal is recorded, the [INDEX] Indication flashes for a few seconds. Ⓐ)
- If the Movie Camera is switched from the VCR Mode to Camera Mode or if the date and time is set before the start of recording, the index signal is not recorded.

■Photoshot Index Search

1 Set [VCR FUNCTIONS] >> [PLAYBACK FUNCTIONS] >> [SEARCH] >> [PHOTO].

2 Press the [▶▶|] Button ❶ or [|◀◀] Button ❷ on the Remote Controller.

- At every press of the corresponding button, the tape is fast-forwarded or rewound to the next still picture recorded in the Photoshot Mode. After reaching the next still picture, the still picture is played back continually, however the sound only for approximately 4 seconds.

■Scene Index Search

1 Set [VCR FUNCTIONS] >> [PLAYBACK FUNCTIONS] >> [SEARCH] >> [SCENE].

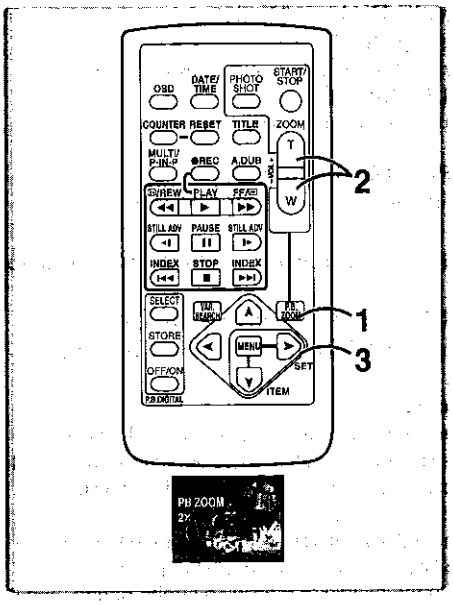
2 Press the [▶▶|] Button or [|◀◀] Button on the Remote Controller.

- When the corresponding button is pressed once, the [S 1] Indication Ⓑ appears, and searching of the subsequent scene marked with an index signal starts. Each time the button is pressed after the start of Scene Index Search, the indication changes from [S 2] to [S 9], and the beginning of the scene corresponding to the selected number will be searched.
- Up to 9 scene numbers can be selected.

Continuous Index Search

If the [▶▶|] Button or the [|◀◀] Button is pressed for 2 seconds or longer, search can be continued at several-second intervals. (To cancel, press the [▶] Button ❸ or the [■] Button ❹.)

- For other notes concerning this item, see page 48.



Playback Zoom Function

A part of the image can be enlarged up to 10 times during playback.

1 During playback, press the [P.B. ZOOM] Button on the Remote Controller.

- The centre of the image is enlarged to approximately 2 times.

To Change the Zoom Magnification

2 Change the magnification by pressing the [W] Button or [T] Button on the Remote Controller.

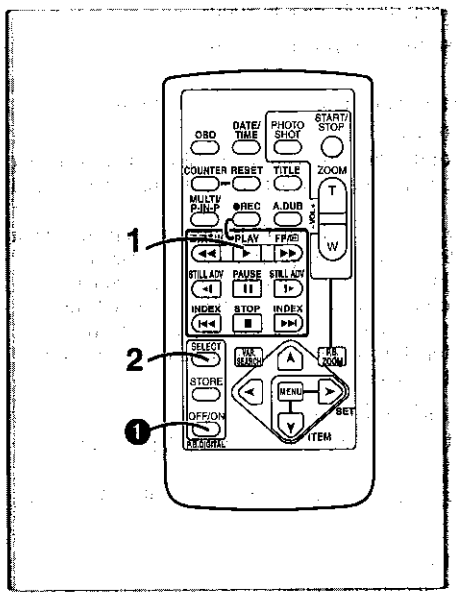
To Change the Enlarging Area of an Image

3 Press the Arrow Button (▲, ◄, ►, ▼) on the Remote Controller that points to the area you want to enlarge.

To Cancel the Playback Zoom Function

Press the [P.B. ZOOM] Button on the Remote Controller.

- For other notes concerning this item, see page 48.



Playback Digital Effect Functions

During playback, special digital effects can be added to the recorded pictures. The same effects as those of Digital Effects 1 and 2, which are used during recording, are obtained.

1 Press the [►] Button.

2 Press the [SELECT] Button of the Remote Controller to select a desired digital effect.

- When the [SELECT] Button is pressed repeatedly, the digital effect selection changes.
- The same setting can be done using [DIGITAL EFFECT] Sub-Menu on the [VCR FUNCTIONS] Main-Menu.

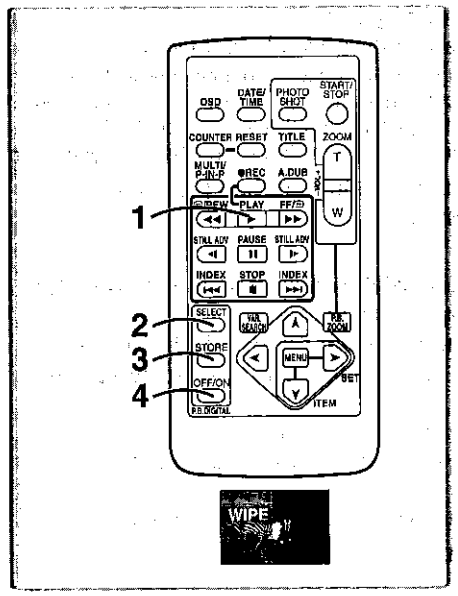
To suspend Playback Digital Effect Temporarily

Press the [OFF/ON] Button ❶ to suspend or restart the digital effect. When the digital effect is paused temporarily, the selected effect's indication flashes.

To Cancel the Digital Effect

Press the [SELECT] Button repeatedly on the Remote Controller and clear the digital effect indication.

- For other notes concerning this item, see page 48.



■ Wipe Mode and Mix Mode

1 Press the [►] Button.

2 Press the [SELECT] Button on the Remote Controller and select [WIPE] or [MIX].

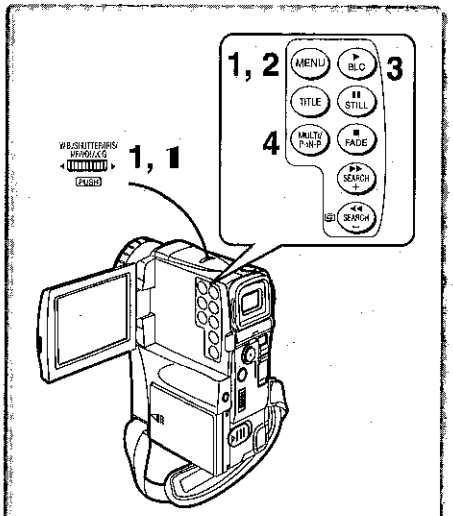
3 Press the [STORE] Button at the moment you want to save as a still picture.

- The [WIPE] or [MIX] Indication appears, and the image is saved.

4 Press the [OFF/ON] Button in the scene in which you want to use the Wipe or Mix effect.

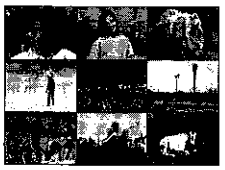
- The scene changes as a result of the Wipe or Mix effect.

- The Wipe Function and Mix Function can be used only from the Remote Controller during playback.
- If the [OFF/ON] Button is pressed while Wipe or Mix is carried out, the effect will stop temporarily at that point. Pressing the [OFF/ON] Button again will bring back the effect.



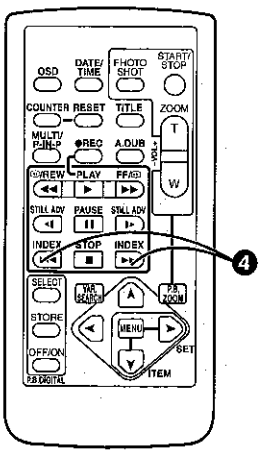
❶

❷



❸

❷



■Playing Back with Multi-Picture Mode

Strobe Multi-Picture Mode [STROBE] ❶:
You can capture 9 consecutive still pictures from playback pictures.
Manual Multi-Picture Mode [MANUAL] ❷:
Selecting the desired still picture one at a time, you can capture 9 still pictures.
Index Multi-Picture Mode ([PHOTO], [SCENE]) ❸:
You can capture 9 screens of pictures to which index signals have been attached.

After setting [EFFECT SELECT] on the [DIGITAL EFFECT] Sub-Menu to [MULTI].....

1 Set [MULTI-PICTURES] >> [SCAN MODE] >> [STROBE], [MANUAL], [PHOTO] or [SCENE], for whichever mode you prefer.

When [STROBE] is selected:

- Set the [SPEED] to a desired strobe speed. At the [FAST] setting, 9 consecutive still pictures is captured within approximately 1 second, at [NORMAL] within approximately 2 seconds, and at [SLOW] within approximately 3 seconds.
- If you set [SWING] on the [MULTI-PICTURES] Sub-Menu to [ON], the intervals at which the 9 still pictures are taken are longer at the beginning and end than in the middle of the swing strobe period, and it is useful for analyzing swing motion, etc., in sports.

2 Exit the Menu by pressing the [MENU] Button.

3 Play back the tape.

- If you select Index mode, it is not necessary to play back the tape.

4 Press the [MULTI] Button.

- **If [STROBE] is selected:** 9 screens are automatically captured starting at the point which the Button is pressed. When 9 screens are captured, the tape will stop.
- **If [MANUAL] is selected:** press the [MULTI] Button at each scene you want to capture. When 9 screens are captured, the tape will stop.
- **If [PHOTO] or [SCENE] is selected:** From the point at which the Button is pressed, 9 screens of pictures to which index signals are attached are captured in the playback direction. After 9 screens are captured, the tape will stop, but, if there are 8 or less pictures to be captured, the tape will stop at its end.

Deleting All the Captured Multi Pictures

While displaying the multi-pictures that have been captured, press the [MULTI] Button or the [▶] Button.

- If [MANUAL] has been selected, press the [MULTI] Button after 9 screens are displayed.

To Display the Multi-pictures again

Press the [MULTI] Button for 1 second or longer.

To Delete Multi-pictures one by one (When Pictures have been captured in Manual Mode)

When the [MULTI] Button is pressed for 1 second or longer while the still pictures are displayed, the picture that was captured last is deleted. If you continue to press the Button, the pictures are deleted consecutively.

- After still pictures are deleted one at a time, they cannot be displayed again.

To Cancel Capturing Pictures midway (When Pictures have been captured in Index Mode)

Press the [■] Button.

To Search the tape position of the desired picture among the playback pictures displayed on 9 screens

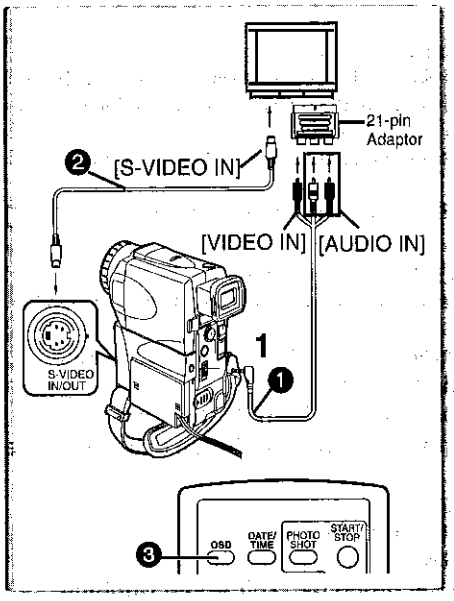
1 After displaying pictures in Multi-Picture Mode, turn the [PUSH] Dial to select the image whose tape position you want to search.

- The selected picture blinks at the red frame.

2 Press Index Button [⏮] or [⏭] ❹ on the Remote controller.

- A still picture playback takes place at the selected picture.

● For other notes, see page 49.



Playing Back on Your TV

By connecting your Movie Camera with your TV, the recorded scenes can be viewed on your TV screen.

- Before connecting them, turn off the power of both the Movie Camera and TV.

1 Connect the [AV OUT] Socket of the Movie Camera and the Video and Audio Input Sockets of the TV.

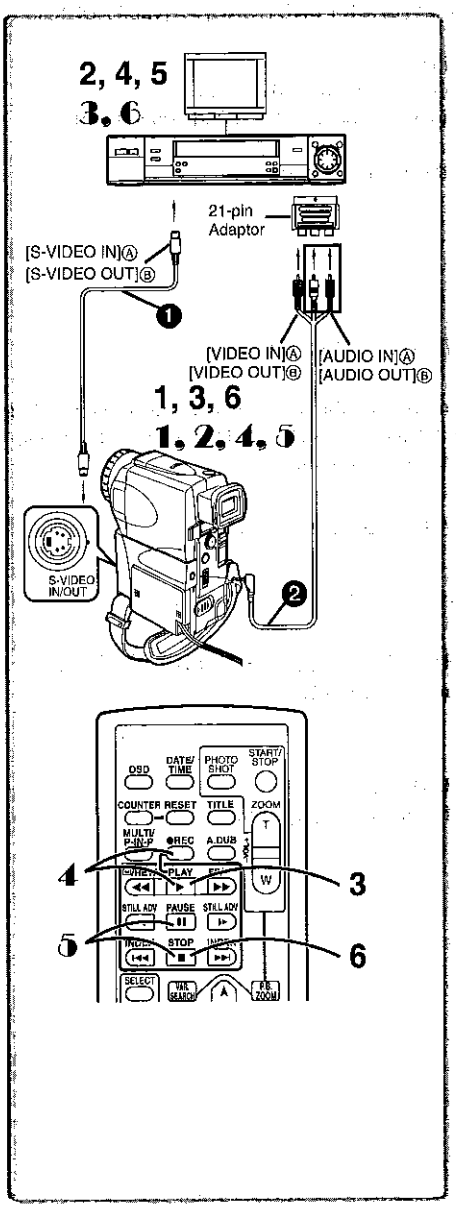
- Using the AV Cable ❶, make a connection with the TV. If the TV has an S-Video Socket, connect the S-Video Cable ❷, too.

To Make the Indications Appear on the TV Screen

Press the [OSD] Button ❸ on the Remote Controller.

- If you set [AV JACK] on the [AV IN/OUT SETUP] Sub-Menu to [IN/OUT], nothing will be shown on the TV screen except during playback.
- If your TV is not equipped with AV Input Sockets, the 21-pin Adaptor (purchase separately) is necessary. Consult your dealer.

- For other notes concerning this item, see page 48.



Copying on an S-VHS (or a VHS) Cassette

(Dubbing)

After connecting the Movie Camera and the VCR as illustrated at left Ⓐ, start the following procedures.

- If your TV is not equipped with AV Input Sockets, the 21-pin Adaptor (purchase separately) is necessary. Consult your dealer.
- Be sure to press the [OSD] Button **(➔ 8)** on the Remote Controller prior to copying so that no indications are visible. Otherwise, the displayed tape counter and function indications are also copied.

Movie Camera:

1 Insert the recorded Cassette.

VCR:

2 Insert an unrecorded Cassette with an erasure prevention tab.

- If various setups (such as external input, tape speed, etc.) are required, please refer to the operating instructions of your VCR.

Movie Camera:

3 Press the [▶] Button to start playback.

VCR:

4 Start recording.

5 Press the Pause or Stop Button to stop recording.

Movie Camera:

6 Press the [■] Button to stop playback.

❶ S-Video Cable (not supplied)
❷ AV Cable

Recording the Contents of Other Equipment

After connecting the Movie Camera and the other equipment as illustrated at left Ⓑ, start the following procedures.

- If your TV is not equipped with AV Input Sockets, the 21-pin Adaptor (purchase separately) is necessary. Consult your dealer.

Movie Camera:

1 Set [VCR FUNCTIONS] >> [AV IN/OUT SETUP] >> [AV JACK] >> [IN/OUT].

2 Insert an unrecorded Cassette.

Other Equipment:

3 Insert a recorded Cassette and start playback.

Movie Camera:

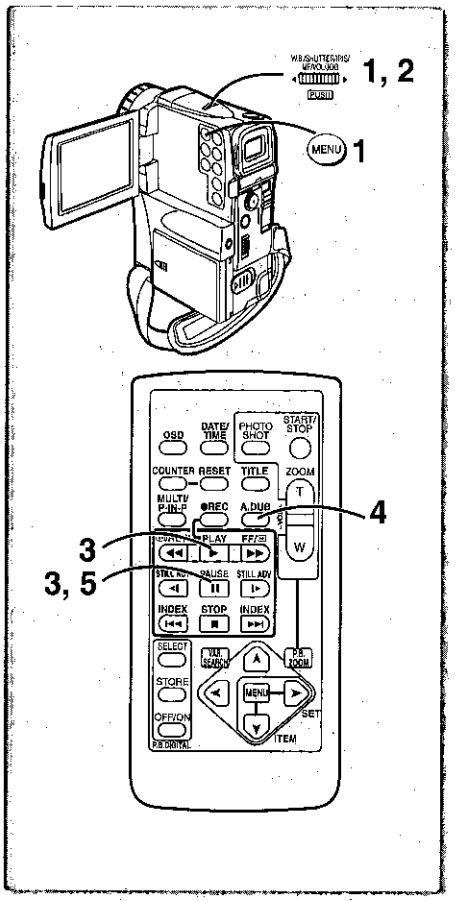
4 While pressing the [REC] Button, press the [PLAY] Button. (Both are on the Remote Controller.)

5 Press the [❚❚] Button or [■] Button to stop recording.

Other Equipment:

6 Press the [■] Button to stop playback.

- For other notes concerning this item, see page 49.



Audio Dubbing

You can add music or narration to the recorded Cassette.

- If the tape recorded in the [16bit] Mode is dubbed with the Audio Dubbing function, the original sound is erased. (If you wish to preserve the original sound, use the [12bit] Mode when recording.)
- Audio Dubbing cannot be performed on a recording done in LP Mode. (➔ 17)

1 Set [VCR FUNCTIONS] >> [AV IN/OUT SETUP] >> [AV JACK] >> [IN/OUT].

2 Select [A.DUB INPUT] >> [MIC] or [AV IN].

- Set to [AV IN] when an external device is used, and to [MIC] when the built-in microphone is used.

3 Switch the Movie Camera over to the Still Playback Mode where you want to add new sound.

4 Press the [A.DUB] Button on the Remote Controller.

5 To start Audio Dubbing, press the [❚❚] Button on the Remote Controller.

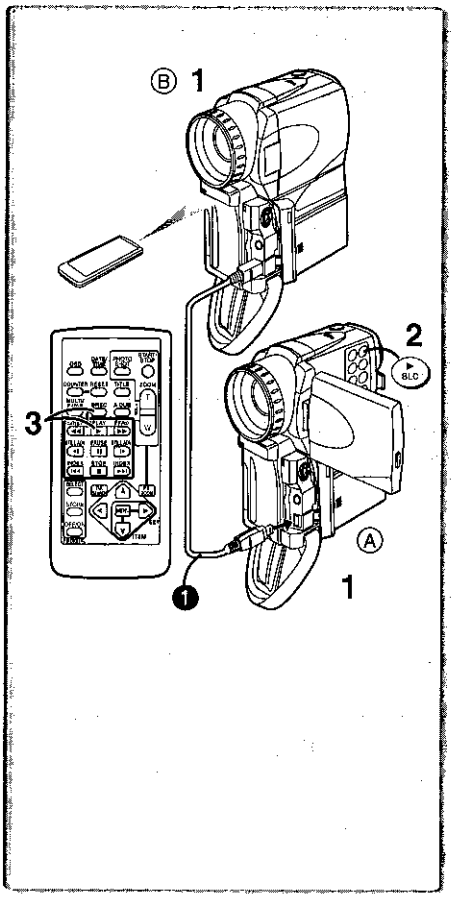
To Cancel Audio Dubbing

Press the [❚❚] Button on the Remote Controller.
The Movie Camera is in the Still Playback Mode again.

To Play Back the Sound Recorded by 12bit Audio Dubbing

Set [VCR FUNCTIONS] >> [PLAYBACK FUNCTIONS] >> [12bit AUDIO] >> [ST2] or [MIX].
ST1: It plays back only the original sound.
ST2: It plays back only the sound added by Audio Dubbing.
MIX: It plays back both the original sound and the sound added by Audio Dubbing simultaneously.

- For other notes concerning this item, see page 49.



Using the DV Cable for Recording

(Digital Dubbing)

By connecting this Movie Camera with other digital video equipment that has a DV Input/Output Terminal (i.LINK) using a DV Cable VW-CD1E (optional) ❶, dubbing can be done in the digital format.

[Player Ⓐ/Recorder Ⓑ]

1 Insert the Cassette and set to the VCR Mode.

[Player Ⓐ]

2 Press the [▶] Button to start playback.

[Recorder Ⓑ]

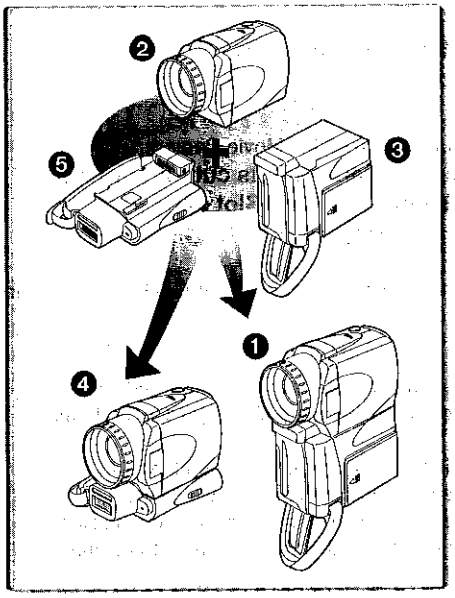
3 While pressing the [REC] Button, press the [PLAY] Button. (Both are on the Remote Controller.)

- Recording starts.

To Stop Dubbing

Press the [❚❚] Button or the [■] Button.

- For other notes concerning this item, see page 49.



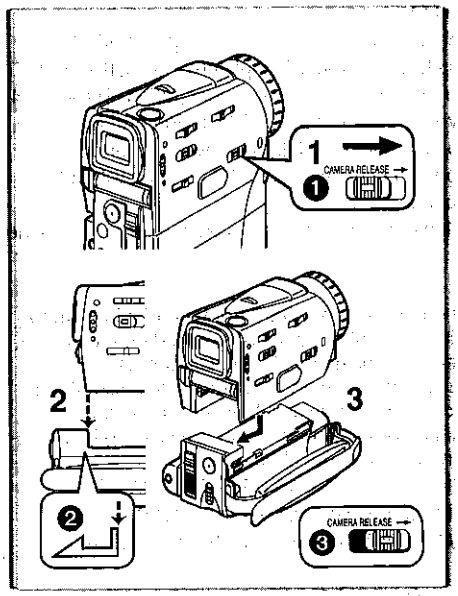
CARD Mode

DV Camera Style and SD Camera Style

This is a Digital Video Camera which can be used in two ways depending on the situation.
One is the DV Camera Style ❶ which combines the Camera Unit ❷ and Video Unit ❸, and the other is the SD Camera Style ❹ which combines the Camera Unit ❷ and the supplied Battery Adaptor Unit ❺.

DV Camera Style
- Both Tape and Card can be used.

SD Camera Style
- It is easy to carry, because of small and light weight.
- Tape cannot be used.



Attaching the Battery Adaptor Unit

Mounting the Battery Adaptor Unit allows the Movie Camera to be compact as well as light and portable.

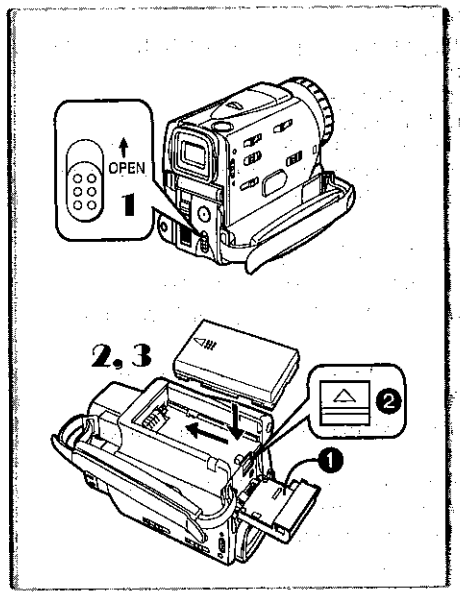
- **Please carry out the Attachment/Removal of the Battery Adaptor Unit while the Movie Camera switch is off. Do not remove the Unit while the operation mode lamp is lit.**

1 While sliding the [CAMERA RELEASE] Lever ❶, pull the Camera Unit straight out to the lens direction.
2 Match the mark ❷ and place the Camera Unit on the adaptor.
3 Slide the Camera Unit until it locks with a click.

Removing the Battery Adaptor Unit

While sliding the [CAMERA RELEASE] Lever ❶, pull the Camera Unit straight out to the lens direction.

- When the red portion ❸ of the [CAMERA RELEASE] Lever shows or Camera Unit is not completely installed, the Movie Camera cannot be on. The Camera Unit must be shifted to the end again and locked.



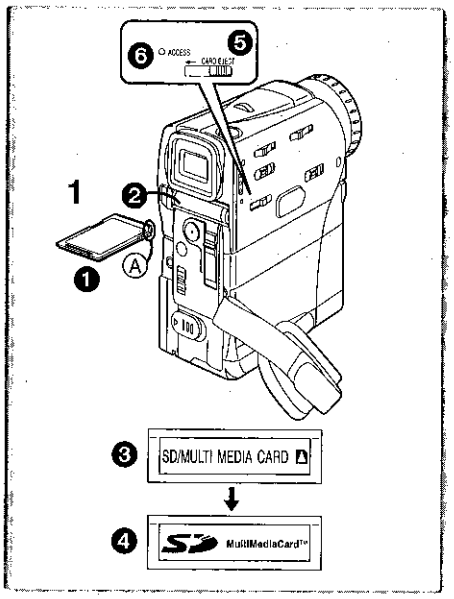
Attaching the Battery

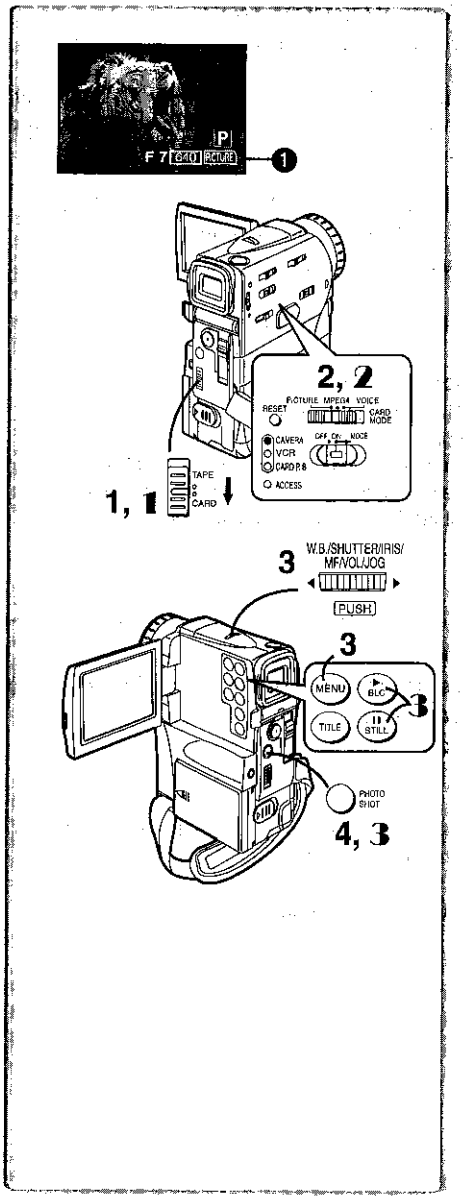
1 Slide the [OPEN] Lever upwards to open the Battery Door ❶.
2 Insert the battery completely.
3 Close the Battery Door.

Removing the Battery

Slide the [OPEN] Lever to open the Battery Door, and then slide the Battery Eject Lever ❷. Finally slide the Battery to remove it.

- For other notes concerning this item, see page 49.





Using a Card

A Card can be used to record files or play back files.

- Use genuine card only.

■Inserting a Card

Before inserting a Card, be sure to turn off the Movie Camera.

1 While holding the Memory Card with its cut off corner Ⓐ facing right ❶, insert it into the Card Slot ❷.

- The display of the Card Slot changes from ❸ to ❹.

Ejecting a Card

After turning the Movie Camera off, slide the [CARD EJECT] Lever ❺ to the left.

■[ACCESS] Lamp ❻

While the Movie Camera is making an access to the Card (reading, recording, playback, erasing or moving of images), the [ACCESS] Lamp lights up.

- While the [ACCESS] Lamp is on, never attempt to open the Card Compartment, to pull out the Card, to turn off the Movie Camera, or to switch the [TAPE/CARD] Selector. Such actions will damage the Card, cause loss of recorded data and cause the Movie Camera to malfunction.

Recording on a Card

Three kinds of data can be recorded by selecting with the [PICTURE/MPEG4/VOICE] Selector Switch. When recording picture, select [PICTURE] (Card PhotoShot), when recording moving picture, select [MPEG4] (MPEG4 Recording), when recording voice, select [VOICE] (Voice Recording).

- If the [TAPE/CARD] Selector is set to [CARD], the Movie Camera is automatically turned off when you leave it for about 6 minutes without performing any photshot recording.
- When the [TAPE/CARD] Selector is set to [CARD], you cannot record to the Tape.

■Card Photoshot

Still pictures can be recorded on the Memory Card from the Movie Camera lens as well as from scenes that have already been recorded on a cassette. The size of images that are recorded using this Movie Camera is approximately 1,080,000 pixels, and recording of images with a size that is larger than a million pixels is called mega-pixel still-picture recording. Compared to images of normal recording, images that are created by mega-pixel still-picture recording can be printed out clearer.

Recording from the Movie Camera Lens (CAMERA Mode)

1 Slide the [TAPE/CARD] Selector towards [CARD].

2 Slide the [PICTURE/MPEG4/VOICE] Selector Switch to [PICTURE].

3 Set [PICTURE SIZE] in [CARD SETUP] Sub-Menu to [1200×900] or [640×480].

- If you select [1200×900], you can take pictures with higher resolution. (Mega-Pixel Recording)

4 Press the [PHOTO SHOT] Button.

- The [PICTURE] Indication light in red. ❶
  Recording is not possible while the [ACCESS] Indication is lit.

- Please use the supplied Lens Hood for MEGA Still Picture Recording in Mega-Pixel Recording. You can get better image.

Recording from a Cassette (VCR Mode)

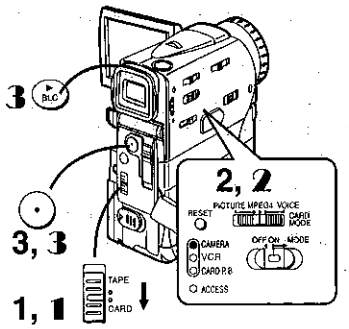
1 Slide the [TAPE/CARD] Selector towards [CARD].

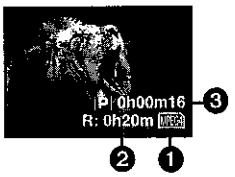
2 Slide the [PICTURE/MPEG4/VOICE] Selector Switch to [PICTURE].

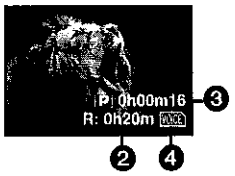
3 Start playback at the scene you want to record, and press the [PHOTO SHOT] Button.

- The size of the images input externally or recorded from a tape to the card becomes [640×480].

- Please refer to "Recording the Contents of Other Equipment" (➔ 49), regarding the recording from other equipment.
- For other notes concerning this item, see page 49.







■Recording a Moving Picture (MPEG4)

It is possible to record approximately 6 minutes moving pictures on supplied 8MB SD Memory Card. If you want to play back on the computer, recorded MPEG4 data can be played back on Windows Media Player. After installing G726 Driver that is enclosed in the supplied USB Connection Kit, play it back with Windows Media Player.

Recording from the Movie Camera Lens (Camera Mode)

1 Slide the [TAPE/CARD] Selector towards [CARD].

2 Slide the [PICTURE/MPEG4/VOICE] Selector Switch to [MPEG4].

3 Press the Recording Start/Stop Button.

- During recording the [MPEG4] Indication ❶ is lit in red. Recording is not possible while the [ACCESS] Indication is lit.

- The picture size of the MPEG4 is set to be [176×144].
- When attaching to email, we recommend the picture size to be less than 1MB (about 1 minute length).

Recording from a cassette (VCR Mode)

1 Slide the [TAPE/CARD] Selector towards [CARD].

2 Slide the [PICTURE/MPEG4/VOICE] Selector Switch to [MPEG4].

3 Start playback at the scene you want to record, press the Recording Start/Stop Button.

❷: Remaining recordable time
❸: Recording time
- For other notes concerning this item, see page 50.

■Recording Voice (Voice Recording)

It is possible to record approximately 25 minutes Voice data on supplied 8MB SD Memory Card.

1 Slide the [TAPE/CARD] Selector towards [CARD].

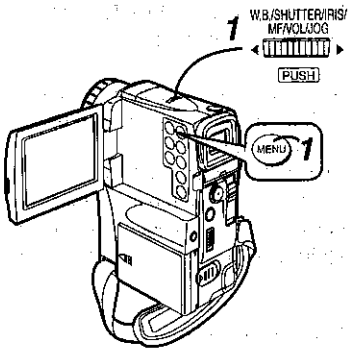
2 Slide the [PICTURE/MPEG4/VOICE] Selector Switch to [VOICE].

3 Press the Recording Start/Stop Button.

- During recording the [VOICE] Indication ❹ is lit in red. Recording is not possible while the [ACCESS] Indication is lit.

❷: Remaining recordable time
❸: Recording time

- For other notes concerning this item, see page 50.



Selecting the quality of Card Photoshot images (excluding Voice Recording)

1 Set [CAMERA FUNCTIONS] or [VCR FUNCTIONS] >> [CARD SETUP] >> [PICTURE QUALITY] >> a desired image quality.

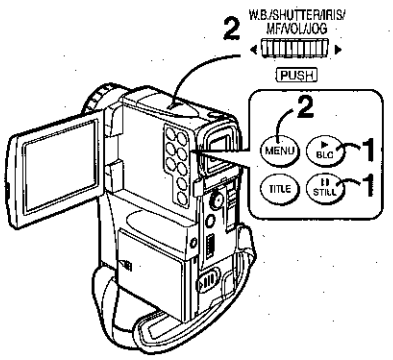
Maximum Number of pictures that can be recorded on the supplied SD Memory Card

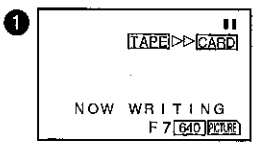
When the size of pictures is [1200×900]

FINE:	approx. 9 pictures
NORMAL:	approx. 16 pictures
ECONOMY:	approx. 25 pictures

When the size of pictures is [640×480]

FINE:	approx. 45 pictures
NORMAL:	approx. 85 pictures
ECONOMY:	approx. 180 pictures





■ Automatically Copying Still Pictures That Have Already Been Recorded on a Tape

The images with the Photo Index signals are automatically recorded to the Card.

1 Set the Movie Camera to Still Playback Mode at the scene immediately before you want to start copying images.

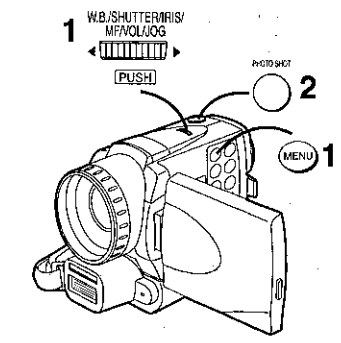
2 Set [VCR FUNCTIONS] >> [PLAYBACK FUNCTIONS] >> [RECORD TO CARD] >> [YES].

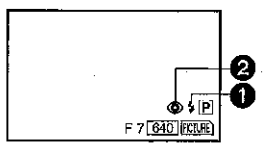
- During copying, the Indication ❶ appears.
- Search starts from the current Tape position, and images with Photo Index signals are recorded onto the Card sequentially.

To Stop Automatic Recording

Press the [■] Button.

- For other notes concerning this item, see page 49.





Using the Video Flash

Using the Video Flash of the Battery Adaptor Unit allows a photoshot in dark places.

Video Flash can be used in SD Camera Style only.

1 Set [CAMERA FUNCTIONS] >> [RECORDING SETUP] >> [FLASH] >> [ON].

- The [ϟ] Indication appears. ❶
- Setting to [AUTO] allows the flash to fire when recording in a dark place.

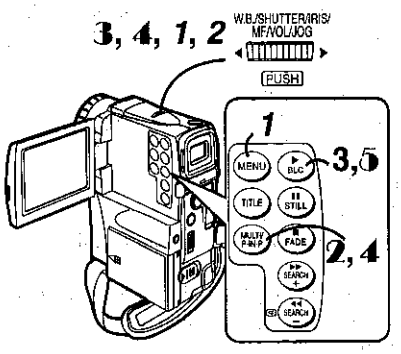
2 Press the [PHOTO SHOT] Button.

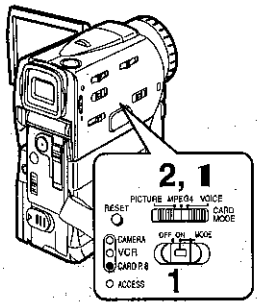
To reduce the "red eyes" phenomenon in your pictures (Red eye reduction)

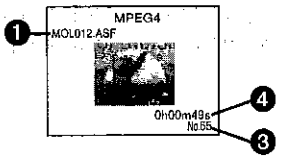
When setting the [RED EYE REDUCTION] on the [RECORDING SETUP] Sub-Menu to [ON], the [◉] indication ❷ is displayed.

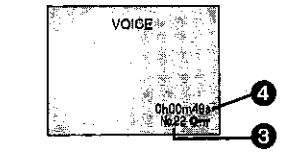
- The available range of the Video Flash is approximately 1 to 2.5 metres in a dark place. Pictures will appear dark when they are recorded using the Video Flash at distances greater than 2.5 metres.
- Continuous Photoshot is not possible if the Video Flash is used.
- When this Movie Camera is SD Camera Style, the Movie Camera detect the surrounding brightness and distinguish the flash is necessary or not. (regardless of setting [FLASH] to [OFF], the [ϟ] flashes when a source of light is necessary.)

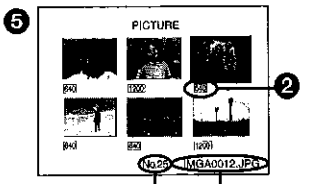
- For other notes concerning this item, see page 50.

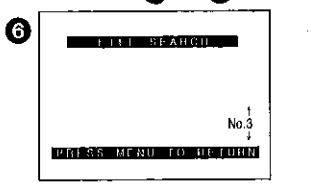












Playing Back a Card

It plays back files recorded on a Card.

1 Set the Movie Camera to Card Playback Mode.
- The [CARD P.B] Lamp lights up.
- The file that was recorded last on the Card is displayed.

2 Slide the [PICTURE/MPEG4/VOICE] Selector Switch to select the type of data.

3 Start Playback.

▶: Playing back the File
▶▶: Playing back the next File
◀◀: Playing back the previous File
■: Stop playing back
❚❚: Pause playing back (When playing back MPEG4 Data or Voice Data, this button doesn't pause playing back within 2 seconds of finishing playing back.)

When [PICTURE] is selected at step2

- When [SLIDE SHOW] is set to [ALL], pressing [▶] makes all the pictures play back continuously.
- When [SLIDE SHOW] is set to [PRESET], pressing [▶] makes Slide Show (→ 39) start.

When [VOICE] is selected at step2

- If you keep pressing the [▶▶] Button or the [◀◀] Button for 1 or more seconds, it becomes 10 × playback, and keep pressing for 7 or more seconds it becomes 60 × playback.

- When [MPEG4] or [VOICE] is selected at step 2, during playing, keep pressing the [PUSH] Dial until the [VOLUME] Indication appears and turn it to adjust the sound volume.

❶ File Name
❷ Picture Size (When [PICTURE] is selected at step 2.)
❸ File Number
❹ Playback Time (When [MPEG4] or [VOICE] is selected at step 2.)

To Select a Desired File and Play It Back

1 Slide the [PICTURE/MPEG4/VOICE] Selector Switch to select the type of data.

2 Press the [MULTI] Button.
- The files recorded on the Card are displayed in Multi-Picture Mode. ❺

3 Turn the [PUSH] Dial and select a desired file.
- The selected file is marked with a frame.
- When 7 or more files have been recorded, turn the [PUSH] Dial to display the next file. (The [◀◀] Button or [▶▶] Button can be used instead of the [PUSH] Dial.)

4 Press either the [PUSH] Dial or the [MULTI] Button.
- The selected file is shown on the entire screen. (Playback the Picture only)

5 Press the [▶] Button.

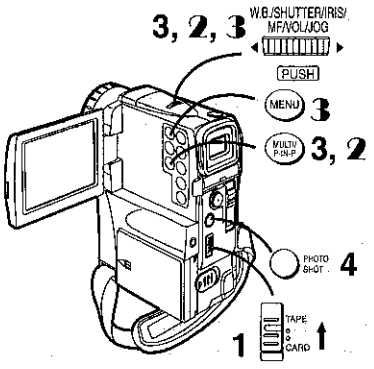
Using File Search Mode

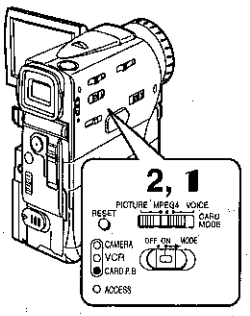
1 Set [CARD FUNCTIONS] >> [CARD EDITING] >> [FILE SEARCH] >> [YES].
- The File search screen ❻ appears.

2 Turn the [PUSH] Dial and select the desired file number, and press the [PUSH] Dial.

- For other notes concerning this item, see page 50.

CARD





❶

REC

NOW RECORDING

Recording Pictures on a Card to a Tape

Card Images can be recorded on the Tape one at a time or all automatically. After setting to Card Playback Mode, please carry out the following steps.

To Copy 1 Picture

1 Slide the [TAPE/CARD] Selector towards [TAPE].

2 Slide the [PICTURE/MPEG4/VOICE] Switch to [PICTURE].

3 Display a desired picture.

4 Press the [PHOTO SHOT] Button.

- During the copying, the Indication ❶ appears.
- It takes approximately a few seconds to record a picture to the Tape.

- In the case of recording to tape, select the tape position before recording. The memory image will be recorded to the tape position where the [PHOTO SHOT] Button is pressed at step 4.

To Copy All the Pictures

1 Slide the [PICTURE/MPEG4/VOICE] Switch to [PICTURE].

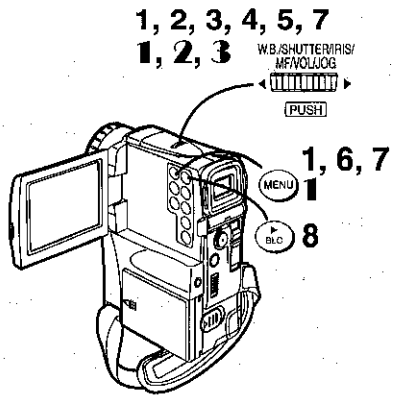
2 Display the first picture.

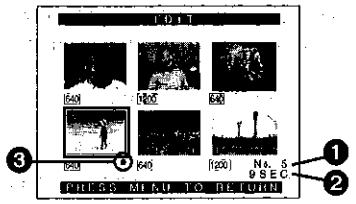
- If a picture other than the first one is displayed, only the subsequent pictures will be copied.

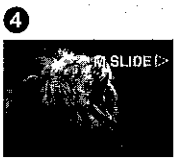
3 Set [CARD FUNCTIONS] >> [CARD EDITING] >> [RECORD TO TAPE] >> [YES].

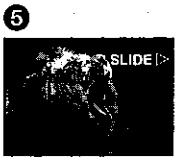
- During the copying, the Indication ❶ appears.
- It takes approximately a few seconds for each picture to be copied on the Tape. To stop the copying midway, press the [■] Button.

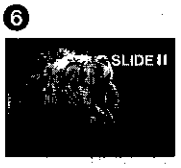
- Moving Picture data and Voice data cannot be recorded from a card to tape.
- When pictures with a size other than [640×480] are copied onto the cassette, their picture quality will deteriorate somewhat.
- The size of the Picture recorded on a Card to a Tape is [640×480].
- During recording from Card to Tape an index signal is automatically recorded.
- Regardless of the setting of [PRESET] in [SLIDE SHOW], data is recorded onto the tape from the currently playing back picture to the last picture.











Slide Show

The recorded still pictures in the Card can be played back like a Slide Show. You can set up a Slide Show or change the content.

To Select Pictures to Play Back in Your Slide Show

1 After set the [PICTURE/MPEG4/VOICE] Switch to [PICTURE], set [CARD FUNCTIONS] >> [CARD EDITING] >> [SLIDE SHOW] >> [YES].
- Slide Show editing screen appears.

2 Set [EDIT] >> [YES].

3 Turn the [PUSH] Dial to select a picture and then press the dial.

4 Turn the [PUSH] Dial to select playback order and then press the dial.
- This step is skipped when there is no picture that has set for the Slide Show.

5 Turn the [PUSH] Dial to adjust the playback time and then press the dial.
- The Playback Order Indication ❶ and the Playback Time (Second) Indication ❷ appear.
- The [●] Indication ❸ is displayed to the picture set.
- To select the next picture, repeat the Steps 3 to 5 above.

6 Press the [MENU] Button to end the setup.

7 After set [SLIDE SHOW] >> [PRESET], press the [MENU] Button.

8 Press the [▶] Button.
- The [M.SLIDE▷] Indication is displayed. ❹

To Play Back All the Pictures Continuously

After setting the [SLIDE SHOW] to [ALL], press the [▶] Button.
- The [SLIDE▷] Indication is displayed. ❺
- All pictures are played back for approximately 6 seconds each, from the first to the last recorded picture, and playback then stops.

To Pause the Slide Show

Press the [❚❚] Button.
- The [(M.) SLIDE❚❚] Indication is displayed. ❻

To Stop the Slide Show

Press the [■] Button.

To Verify the Selected Picture

Set [CARD FUNCTIONS] >> [CARD EDITING] >> [SLIDE SHOW] >> [YES] >> [VERIFY] >> [YES].
- Only the selected pictures are displayed in Multi-Picture Mode in the Playback order.

To Delete the Selected Picture

1 Set [CARD FUNCTIONS] >> [CARD EDITING] >> [SLIDE SHOW] >> [YES].

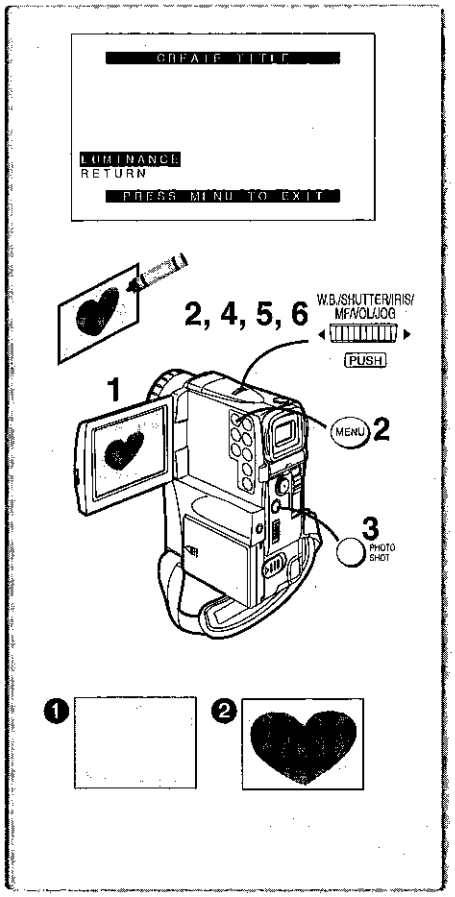
2 Set [DELETE] >> [YES].

3 Select the picture you want to delete and press the [PUSH] Dial.

To Reset the Slide Show Setup

Set [CARD FUNCTIONS] >> [CARD EDITING] >> [SLIDE SHOW] >> [YES] >> [RESET] >> [YES] >> [YES].
- Slide Show settings are reset.

- For other notes concerning this item, see page 50.



Creating a Title

You can create a title and record on a Card.

1 Camera Mode:
Set the Lens to the image you want to use for creating a title.
VCR Mode:
Search for the image you want to use for creating a title and set the Movie Camera to the Still Playback Mode.

2 Set [CARD SETUP] >> [CREATE TITLE] >> [YES].

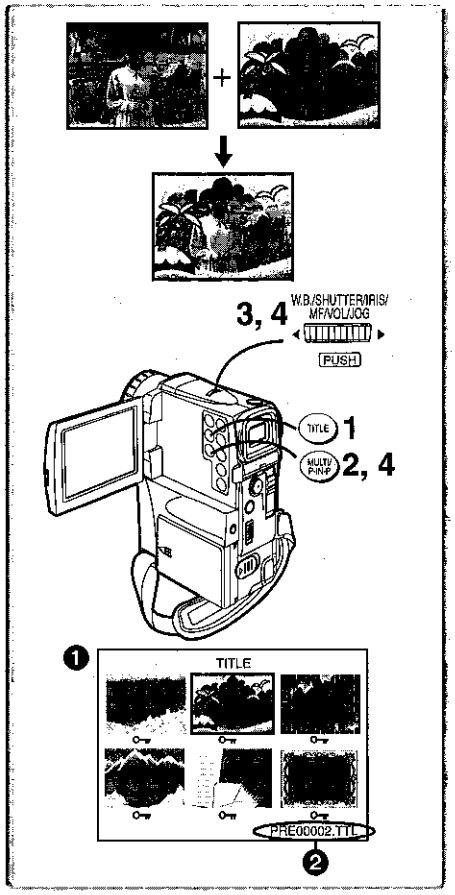
3 Press the [PHOTO SHOT] Button.
- The title is stored.
- To perform Photoshot again, select [RETURN].

4 Select [LUMINANCE] and press the [PUSH] Dial, turn it to adjust the title contrast and press it.

5 Select [COLOUR] and press the [PUSH] Dial, turn it to adjust the colour and press it.
- The dark portion of the image is missing ❶, and the colours of the bright portion change in order the original colour, black, blue, green, cyan, red, pink, yellow, and white, after which the bright portion of the image is missing ❷ and the colours of the dark portion change in the above order.

6 Select [RECORD] and press the [PUSH] Dial.
- The title is recorded on the card.

- During MPEG4 recording Mode and Voice recording Mode, creating title is not possible.
- For other notes concerning this item, see page 50.



Adding a Title

A title can be added to the picture. It is displayed in Camera Mode, VCR Mode and Card Playback Mode.
But when the [PICTURE/MPEG4/VOICE] Selector Switch is set to [MPEG4] or [VOICE], adding a Title is not possible.

1 Press the [TITLE] Button.
- The title is displayed.

2 Press [MULTI] Button.
- A list of titles is displayed. ❶

3 Turn the [PUSH] Dial to select a desired title.
- The selected title is marked with a frame.

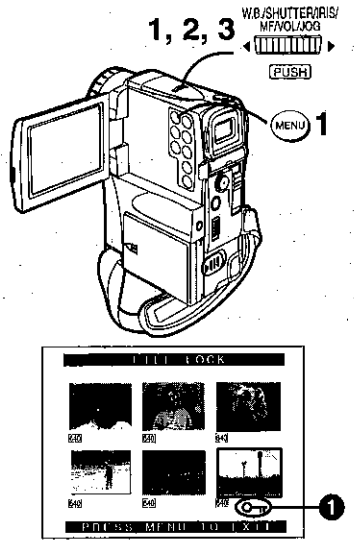
4 Press the [PUSH] Dial or press the [MULTI] Button.
- The selected title is displayed.
- Recording and Photoshot Recording can be done with pictures that have titles.

❷ File Name

To Clear the Title Display

Press the [TITLE] Button.

- The [ACCESS] Indication appears until the titles are displayed completely. Perform the Recording after the Indication disappears.
- The supplied Card contains titles. If an original title has not been created, a preset title will be displayed.
- For other notes concerning this item, see page 51.



Protecting the Files on a Card

(Lock Setting)

Precious files recorded on a Card can be locked (to prevent accidental erasure). (Even if files are locked, the files will be deleted when the Card is formatted.)

1 Set [CARD FUNCTIONS] >> [CARD EDITING] >> [FILE LOCK] >> [YES].
- The [FILE LOCK] Menu is displayed.

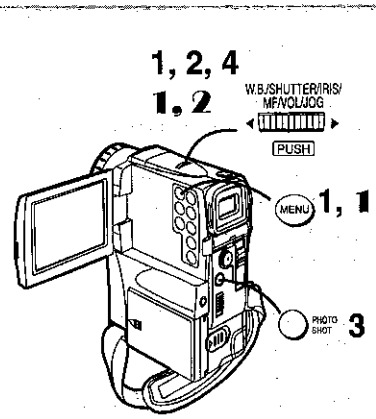
2 Select [PICTURE] or [TITLE].

3 Select the file to be locked, and press the [PUSH] Dial.
- The [⊶] Indication ❶ is attached to the selected file. Repeat this procedure to lock 2 or more.
- Press the [PUSH] Dial again to cancel.

- The Lock Setting carried out by this Movie Camera is only effective for this Movie Camera.

About write protection switch of the SD Memory Card

- The SD Memory Card has a write protection switch on it. If the switch is moved to the [LOCK] side, you cannot write to , delete the data, or format the Card. If it is moved back, you can.



Deleting the Files Recorded on a Card

Using the Movie Camera, you can delete the files recorded on a Card. After the file is deleted, it cannot be restored.

- Please select the files to be deleted with [PICTURE/MPEG4/VOICE] Selector Switch. To erase a title, set the [PICTURE/MPEG4/VOICE] Selector Switch to [PICTURE].

To Select and Delete Files

1 Set [CARD FUNCTIONS] >> [ERASE CARD FILE] >> [ERASE FILE BY SELECTION].
- To erase a title, select [ERASE TITLE BY SELECTION].

2 Select the file you wish to delete and press the [PUSH] Dial.
- The frame around the selected file flashes.

3 Press the [PHOTO SHOT] Button.
- A verification message appears.

4 Select [YES] and press the [PUSH] Dial.
- The selected file is deleted from the Card.
- If [NO] is selected, the file selection is cancelled.

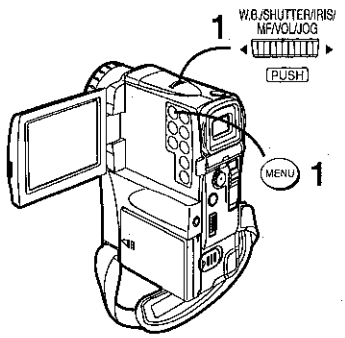
- To erase 2 or more files, repeat steps 2-4.

To Select and Delete All Files

1 Set [CARD FUNCTIONS] >> [ERASE CARD FILE] >> [ERASE ALL FILES].
- A verification message appears.

2 Select [YES] and press the [PUSH] Dial.
- All files with the selected Card Mode ([PICTURE], [MPEG4] or [VOICE]) will be deleted.
- A locked file cannot be erased.

- Do not delete the Voice Files that recorded with this Movie Camera using other devices.
- When you delete Voice File, be sure to cancel the Lock setting before deleting.

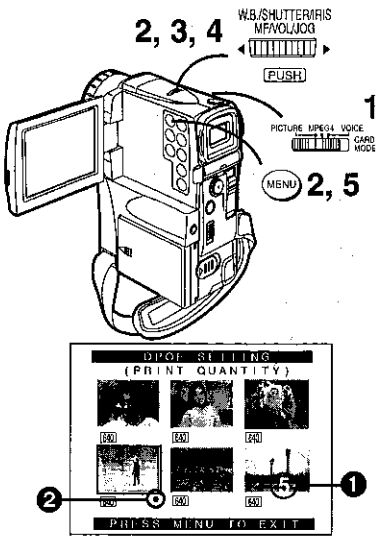


Formatting a Card

If a Card becomes unreadable by the Movie Camera, formatting it may make it reusable. Formatting erases all the data recorded on a Card.

1 Set [CARD FUNCTIONS] >> [CARD EDITING] >> [CARD FORMAT] >> [YES].

- Since a confirmation message appears, select [YES] and formatting will be carried out.
- When the formatting is completed, the screen becomes white.
- It may not be possible to use the Card which was formatted using this Movie Camera on another unit. In this case, format the Card on the unit which will be using the Card. Take steps to ensure that valuable files are stored on the personal computer, etc. as well before proceeding.



Writing Printing Data on a Card

(DPOF Setting)

DPOF Setting Printing data (DPOF Settings), such as the number of images to be printed, can be written to the Card. "DPOF" means Digital Print Order Format.

1 Slide the [PICTURE/MPEG4/VOICE] Switch to [PICTURE].

2 Set [CARD FUNCTIONS] >> [CARD EDITING] >> [DPOF SETTING] >> [YES] >> [VARIABLE].

- To print all pictures one at a time, select [ALL 1]. When all images are not printed, select [ALL 0].

3 Select a desired picture and press the [PUSH] Dial.

- The number of prints set by DPOF is displayed. ❶
- The selected image is marked with a frame.

4 Turn the [PUSH] Dial and select the number of pictures to be printed, and press the [PUSH] Dial.

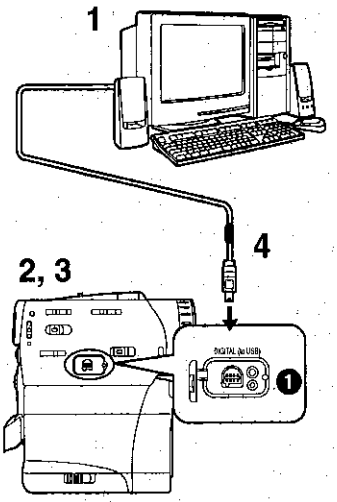
- When DPOF setting is set to 1 or more files, the [●] Indication ❷ appears in white. When both DPOF setting (is set to 1or more files) and Slide Show setting are completed, the [●] Indication ❷ appears in blue.

5 Repeat Step 3 and 4 and press the [MENU] Button when the setup is completed.

To Verify DPOF Setting

Select [VERIFY] in Step 2 above. The pictures for which 1 or more print is set in DPOF are played back continuously.

- The number of prints can be set from 0 to 99.
- Perform the DPOF Settings with your own Movie Camera in use.
- Verifying the DPOF Settings may take a little time. Wait until the [ACCESS] Lamp goes out.

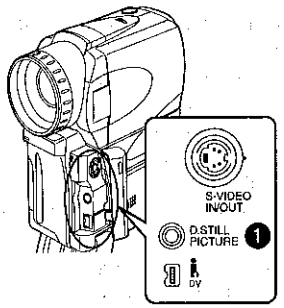


Using the USB Connection Kit

Using the supplied USB Connection Kit, you can import still pictures on the card into your personal computer.

1 Install the supplied USB driver.
2 Set the Movie Camera to Card Playback Mode.
3 Set the Movie Camera to Still Playback Mode.
4 Connect the supplied USB Cable to [DIGITAL (to USB)] Socket ❶.
- It enters PC connection mode.

- The USB Connection Kit can be used with Windows98 Second Edition/Me/2000.
- Use the AC Adaptor as power source for the Movie Camera. (The Card or its contents may be destroyed if battery power is lost while transmitting data.)
- Mode cannot be changed in PC connection mode by sliding the [OFF/ON/MODE] Selector Switch.
- For more details on the operating environment, installation, connections, and procedures, please refer to USB Connection Kit's operating instructions.



Personal Computer Connection Kit

Using the optional Personal Computer Connection Kit, you can import still pictures into your personal computer.

Use the Digital Still Picture Terminal [D.STILL PICTURE] ❶ when using the Personal Computer Connection Kit.

- When recording, be careful not to cut off the Time Code from the start of the tape.
- Mega-Pixel picture cannot be imported. The picture size is [640×480].
- MPEG4 data or Voice data cannot be used.
- For more details on the operating environment, connections, and procedures, please refer to Personal Computer Connection Kit's operating instructions.

Others

Indications

Various functions and the Movie Camera status are shown on the screen.

[▬▬]: Remaining Battery Power

- When the battery power becomes low, the Indication changes. When the battery is discharged completely, the [▬] ([ ]) indication flashes.
  (When you are using the AC Adaptor, the [▬▬] Indication may appear, however, this is not a malfunction.)

R0:45: Remaining Tape Time

- Remaining tape time is indicated in minutes. (When it reaches less than 3 minutes, the indication starts flashing.)

CINEMA: Cinema Mode (➜ 21)
D.ZOOM: Digital Zoom (➜ 20)
MULTI: Multi-Picture Mode (➜ 25)
P-IN-P: Picture-in-Picture Mode (➜ 25)
WIPE: Wipe Mode (➜ 24)
MIX: Mix Mode (➜ 24)
STROBE: Strobe Mode (➜ 24)
GAINUP: Gain-up Mode (➜ 24)
TRACER: Trailing Effect Mode (➜ 24)
MOSAIC: Mosaic Mode (➜ 24)
MIRROR: Mirror Mode (➜ 24)
NEGA: Negative Mode (➜ 24)
SEPIA: Sepia Mode (➜ 24)
B/W: Black & White Mode (➜ 24)
SOLARI: Solarisation Mode (➜ 24)
PB ZOOM: Playback Zoom (➜ 29)
SP: Standard Mode (Recording Speed Mode) (➜ 17)
LP: Long Play Mode (Recording Speed Mode) (➜ 17)
INDEX: Index signal recording (➜ 28)
S 1: Search Number (➜ 28)
5×: Zoom Magnification Indication (➜ 19)
AUTO: Automatic Mode (➜ 18)
MNL: Manual Mode (➜ 22, 23)
: Image Stabilizer (➜ 20)
MIC, AV IN: Audio Dubbing Input Display (➜ 32)
12 bit, 16 bit: Audio Recording Mode (➜ 17)
MF: Manual Focus (➜ 23)
: Back Light Mode (➜ 21)
: Sports Mode (Programme AE) (➜ 21)
: Portrait Mode (Programme AE) (➜ 21)
: Low Light Mode (Programme AE) (➜ 21)
: Spotlight Mode (Programme AE) (➜ 21)
: Surf & Snow Mode (Programme AE) (➜ 21)
REC: Recording (➜ 18)
PAUSE: Recording Pause (➜ 18)
▷: Playback (➜ 26)/Forward Camera Search (➜ 18)
◁: Reverse Camera Search (➜ 18)
❚❚: Still Playback (➜ 27)
▷▷: Fast-forward/Cue Playback (➜ 26)
◁◁: Rewind/Review Playback (➜ 26)
◁❚, ❚▷: Slow Motion Playback (➜ 27)
◁❚❚, ❚❚▷: Still Advance Playback (➜ 27)
|◁◁, ▷▷|: Index Search (➜ 28)
CHK: Recording Check (➜ 18)
A.DUB ▷: Audio Dubbing (➜ 32)
A.DUB ❚❚: Audio Dubbing Pause (➜ 32)
PHOTO: Photoshot Mode Recording (➜ 19)
BLANK: Blank Search (➜ 27)
R ▷: Repeat Playback (➜ 48)
2× ▷▷: Variable Speed Search (➜ 26)
1/500: When you adjust shutter speed manually, this indication appears. (➜ 23)
F2.4: When you adjust the F Number manually, this indication appears. (➜ 23)
AWB: Automatic White Balance Mode (➜ 22)
: Indoor Mode (recording under incandescent lamp) (➜ 22)
: Outdoor Mode (➜ 22)
: White Balance setting Mode (➜ 22)
WIND CUT: Wind Noise Reduction (➜ 14)
[P]: Progressive Photoshot Mode (➜ 19)
VOLUME: Volume adjustment (➜ 26)
15:30:45: Date/Time Indication (➜ 45)
PICTURE: Picture (➜ 34, 37)
TITLE: Title Picture (➜ 40)
MPEG4: Moving Picture (MPEG4) (➜ 35, 37)
VOICE: Voice Data (➜ 35, 37)
SLIDE▷: Slide Show Playback (➜ 39)
SLIDE❚❚: Slide Show Playback Pause (➜ 39)
M.SLIDE▷: Manual Slide Show Playback (➜ 39)
M.SLIDE❚❚: Manual Slide Show Playback Pause (➜ 39)
N (F, E): Card Photoshot Picture Quality (during Card Photoshot recording) [F] means Fine, [N] means Normal and [E] means Economy. (➜ 34, 35)
ACCESS: While Card is being read (during Playback, Formatting and Multi-Picture Function use). (➜ 37, 42)
[PICTURE] ([MPEG4], [VOICE]) (Red): Card Recording (➜ 34, 35)
[PICTURE] ([MPEG4], [VOICE]) (flashing in red): Card is not inserted (➜ 34)
[PICTURE] ([MPEG4], [VOICE]) (cyan): Card Recording preparation completed (➜ 34, 35)
00: Remaining Number of Card Photoshot pictures (➜ 34)
R: 0h15m: Remaining time of Moving Picture Recording and Voice Recording
0h00m05s: Recording time of Moving Picture Recording and Voice Recording
: Lock Setting (➜ 41)
● (White): DPOF Setting completed (set to 1 or more picture) (➜ 42)
● (Green): Slide Show Settings completed (➜ 39)
● (Blue): DPOF Setting (set to 1 or more picture)/ Slide Show Settings both completed (➜ 39, 42)
[1200]: [1200×900] Image size
[640]: [640×480] Image size

- For images not recorded with this Movie Camera, the size display is determined as follows according to the number of horizontal pixels.

[640]: From 640 to 800 (The size is not displayed at under 640 pixels.)
[SVGA]: From 800 to 1024
[XGA]: From 1024 to 1280
[SXGA]: From 1280 to 1600
[UXGA]: Over 1600
: Video Flash (➜ 36)
: Red eye reduction (➜ 36)

■To Change the Counter Display Mode

By changing [C.DISPLAY] on the [DISPLAY SETUP] Sub-Menu, you can change the Counter Display Mode to Tape Counter Indication [COUNTER] (0:00.00), Memory Counter Indication [MEMORY] (M0:00.00), and Time Code Indication [TIMECODE] (0h00m00s00f). By repeatedly pressing the [COUNTER] Button on the Remote Controller, you can change the Counter Display Mode.

■To Display Date/Time Indication

To display Date/Time Indication, set the appropriate Date/Time in [DATE/TIME] on the [DISPLAY SETUP] Sub-Menu. You can also press the [DATE/TIME] Button of the Remote Controller repeatedly to display or change the Date/Time Indication.

■To Change the Display Mode

By changing [DISPLAY] on the [DISPLAY SETUP] Sub-Menu, you can change the Display Mode to All Function Display [ALL], Partial Display [PARTIAL], and Minimum Display [OFF].

Owner ID

You can register your name and address in your Movie Camera to identify the owner.

1 **Set [CAMERA FUNCTIONS] >> [OTHER FUNCTIONS] >> [OWNER ID SET] >> [YES].**
- The Owner ID setup screen appears.

2 **Turn the [PUSH] Dial to select [PIN NUMBER]/[NAME]/[HOUSE No.]/[POSTCODE] and press the [PUSH] Dial to enter the setup mode.**

3 **Turn the [PUSH] Dial to select characters and press the [PUSH] Dial to enter them.**
- You can input four digits in [PIN NUMBER], up to 12 characters in [NAME], and up to 11 characters in [HOUSE No.] and [POSTCODE].

4 **Press the [■] Button to exit the setup mode.**
- By keeping pressing the [▮▮] Button approximately 5 seconds, you can verify the owner ID easily.

To Check Owner ID

If Owner ID has already been set, carrying out Step 1 above will display [INPUT PIN NUMBER] on the screen. Input the Pin Number you have already selected. If the number is not correct, the screen will not change. If the number is correct, the contents of the setup will be displayed. (By repeating Steps 2 to 4 above, you can change the contents.)

Warning/Alarm Indications

If any one of the following indications lights up or flashes, please check the condition of the Movie Camera.
- Some Indications may not be displayed according to the model.

[💧]:	Condensation has occurred. **(➔ 53)**
[📼]:	The accidental erasure prevention slider on the inserted Cassette is open (that is, set to [SAVE]). You are about to do audio dubbing on the unrecorded (blank) portion of the tape. No Cassette is inserted. **(➔ 11)**
[🔋]:	The Battery is low. Recharge it. **(➔ 10)**
[🔋]:	The built-in battery is discharged. **(➔ 17)**
[⊗]:	The video heads are dirty. **(➔ 53)**
[📼]END:	The tape came to end during recording.
REMOTE:	Wrong Remote Controller Mode has been selected. **(➔ 9)**
UNPLAYABLE TAPE (OTHER FORMAT):	You are attempting to play back a tape section that has been recorded with a different TV system.
UNABLE TO A. DUB (LP RECORDED):	Because the original recording was done in LP Mode, audio dubbing cannot be performed.
INCOMPATIBLE TAPE:	This Cassette is incompatible.
PLEASE RE-OPERATE AFTER PUSHING RESET BUTTON:	Mechanism Irregular is detected. Press the [RESET] Button **(➔ 7)**. This may solve the problem.
TO SERVICE:	It is a malfunction.
CARD FULL:	Card does not have sufficient memory remaining. Select Card Mode ([PICTURE], [MPEG4] or [VOICE]) and delete unwanted files.
NO CARD:	Card is not inserted.
NO FILE:	Card has no files recorded on it.
CARD ERROR:	This Card is not compatible with this Movie Camera.
COPY INHIBITED:	Because the medium is protected by a copy guard, images cannot be recorded correctly.
INCORRECT OPERATION:	Card Mode Selector is set to [MPEG4] or [VOICE] when [PHOTO SHOT] Button is pressed. You are attempting to record to a card in tape Mode. You are attempting to record to a tape in card Mode.

Notes and Hints

Concerning the Power Supply

- When the Movie Camera is used for a long time, the Camera body becomes warm, but this is not a malfunction.
- If the [CHARGE] Lamp does not light up although the Battery is attached to AC Adaptor, detach the Battery and reattach it.

Inserting/Removing the Cassette

- In the case of using a previously recorded Cassette, you can use the Camera Search Function or Blank Search Function to find the position where you want to continue recording.
- If a new Cassette is inserted, rewind to the beginning of the tape before starting recording.
- When inserting the cassette, make sure it faces in the right direction and then push it in until it stops.
- When opening or closing the Cassette Compartment, push down the buckle of the Grip Belt so that it does not obstruct the opening and closing of the Cassette Compartment.

Alarm Sounds

When [BEEP SOUND] on the [OTHER FUNCTIONS] Sub-Menu on the [CAMERA FUNCTIONS] Main-Menu is set to [ON], confirmation/alarm beeps are issued as follows.

1 Beep

- When you start recording
- When you switch the [OFF/ON/MODE] Switch from [OFF] to [ON]

2 Beeps

- When you pause recording

10 Beeps

- If you perform a wrong operation before or during recording

Recording

- Before turning on the power, remove the Lens Cap. If the Lens Cap is still attached when the power is turned [ON], Automatic White Balance Adjustment (➔ **56**) may not function correctly.

Recording Check

- For Recording Check, the recording speed mode (SP/LP) must be the same as the mode used for the recording. If different, playback images will be distorted.

Camera Search

- In Camera Search Mode, images may contain mosaic-pattern noise. This is a phenomenon that is characteristic of digital video and not a malfunction.
- If the recording speed modes (SP/LP) of previous recording and new recording are different, playback images may be distorted.

Photoshot

- Photoshot Recording results in slightly inferior image quality.

Progressive Photoshot Function

- The still pictures are recorded at a slightly rewound point from where you press the [PHOTO SHOT] Button.
- When you change to the Still Picture Mode, you will hear a click. This is the sound of the iris closing and not an indication of malfunction.
- If you record still pictures in Progressive Photoshot Mode when your Movie Camera is set to Programme AE (➔ **21**), the brightness of the images may change.

About [PROGRESSIVE] Setup

- When the [P] Indication is displayed, you can use the Progressive Photoshot Function.

When [PROGRESSIVE] is [ON]:

You can use the Progressive Photoshot Function at any time. In this case, however, the following functions are disabled.

- Digital Effect Modes in [EFFECT1] (➔ **24**)
- Digital Zoom [D.ZOOM] (➔ **20**)
- 1/750 s or faster shutter speed (➔ **23**)

When [PROGRESSIVE] is set to [AUTO]

You cannot use the Progressive Photoshot Function in the following cases.

- When the zoom magnification is approximately 10× or higher
- When the shutter speed is 1/750 s or faster
- When [EFFECT1] is set to [WIPE], [MIX], [STROBE], [GAINUP], [TRACER], [MOSAIC], [MIRROR]
- When the pictures are displayed on a Multi-Picture screen.

Zoom In/Out Functions

- When you are zooming on a faraway subject, a sharper focus is achieved if the recording subject is 1.2 metres or more away from the Movie Camera.

Image Stabilizer Function

- When a tripod is used, it is recommended that you turn the Image Stabilizer off.
- Within the digital zoom range, the stabilizer function may not work effectively.

Cinema Function

- Using the Cinema Mode does not widen the recording angle.
- If you play back tape recorded in Cinema Mode on a wide-screen (16:9) format TV, playback size is automatically adjusted to fit the TV screen format. Please refer to the TV's operating instructions for details.
- When images are displayed on a TV screen, the Date/Time Indication may be erased in some cases.
- Depending on the TV, the image quality may be deteriorated.
- The Cinema Mode is cancelled when a Title is displayed.
- It is not possible to record on a card in the Cinema mode.

Programme AE

- If any of the Programme AE Modes is selected, you cannot adjust the shutter speed (➔ 23) or iris (➔ 23).
- When you set [EFFECT1] of [DIGITAL EFFECT] Sub-Menu on the [CAMERA FUNCTIONS] Main-Menu to [GAINUP], it is not possible to change the programme AE setting. (When Sport Mode or Portrait Mode is used, programme AE is set to [OFF].)

Sports Mode

- When playing back recorded in the Sports Mode, you can enjoy slow motion and still playback of very sharp images with fine details.
- During normal playback, the image movement may not look smooth.
- Because the colour and brightness of the playback image may change, avoid recording under fluorescent light, mercury light, or sodium light.
- If you record a subject illuminated with strong light or a highly reflective subject, vertical lines of light may appear.
- If the light is insufficient, the [ ] Indication flashes.

Sports Mode/Portrait Mode

- If you record a still picture in Progressive Photoshot Mode, the brightness and hue of the recorded still picture may become unstable.
- If this mode is used for indoor recording, playback images may flicker.

Low Light Mode

- Extremely dark scenes may not be able to be made brighter to a satisfactory degree.

Spotlight Mode

- With this mode, recorded images may turn out to be extremely dark.
- If the recording subject is extremely bright, its recorded image may turn out to be whitish.

Surf & Snow Mode

- If the recording subject is extremely bright, its recorded image may turn out to be whitish.

White Balance

- If you set both White Balance and Iris, set White Balance first.

In the following cases, You cannot change White Balance:

- When you set [EFFECT1] of [DIGITAL EFFECT] Sub-Menu on the [CAMERA FUNCTIONS] Main-Menu to [GAINUP] or [EFFECT2] to [SEPIA] or to [B/W].
- When you set the Zoom to 10 × or higher.
- During Digital Still Picture Mode
- When you display a Menu.

In the following cases, the [ ] Indication flashes:

- The flashing indicates that the previously adjusted White Balance setting is still kept. This setting will be kept until White Balance is adjusted again.
- You may not be able to achieve correct White Balance adjustment manually under weak illumination.

Manual Shutter Speed Adjustment

- You may see vertical lines of light in the playback image of a brightly shining subject or highly reflective subject.
- During normal playback, movement in the images may not look smooth.
- Because the colour and brightness of the playback image may become unstable, avoid recording under fluorescent light, mercury light, or sodium light.
- If you are using either Gain-up Mode (➔ 24) or Programme AE Mode (➔ 21), you cannot adjust the shutter speed. If the shutter speed has adjusted manually, this setting will be cancelled.

Manual Iris Adjustment

- Depending on zoom magnification, there are iris values that will not be displayed.
- If you are using either Gain-up Mode (➔ 24) or Programme AE Mode (➔ 21), you cannot adjust the iris. If the iris has adjusted manually, this setting will be cancelled.
- If you attempt to adjust the Shutter Speed after setting the Iris, the value set for the Iris will be cancelled.

■Digital Effect Functions (Camera Mode)

It is as follows when [GAINUP] is selected.

- You need to adjust the Focus manually.
- The shutter speed, White Balance and Iris cannot be operated.
- The Sports Mode [ ] and the Portrait Mode [ ] are cancelled.
- It is not possible to use [MULTI], [P-IN-P], [WIPE], [MIX] or [TRACER] of [EFFECT1] together with the digital modes of [EFFECT2] on the [DIGITAL EFFECT] Sub-Menu.
- If you have set [EFFECT2] to [B/W] or [SEPIA], changing the selected White Balance Mode is not possible. **(→ 22)**

In the following cases, using the [EFFECT1] on the [DIGITAL EFFECT] Sub-Menu is not possible.

- When [PROGRESSIVE] is set to [ON]
- Card Mode

In the following case, using the Digital Effect Function is not possible.

- Card Mode

Wipe Mode and Mix Mode

If either one of the following operations is carried out, stored images will be erased, and Wipe and Mix Functions cannot be used.

- Use the Camera Search Function
- Press the [STILL] Button
- Switch the [TAPE/CARD] Selector
- Slide the [OFF/ON/MODE] Switch

Multi-Picture Mode

- If the [MULTI] Button is pressed while self-recording Mirror mode **(→ 18)** is used, the still picture is displayed from the upper right corner of the screen, but, in reality, the picture is recorded from the upper left corner as usual.
- The quality of images recorded in Multi-Picture Mode deteriorates slightly.
- The top and bottom of the Multi Pictures will be cut off slightly.
- The Multi-Picture Mode cannot be used while the Still Picture Mode is used.

P-IN-P Mode

- Pictures in P-IN-P Mode cannot be recorded with Progressive Photoshot.
- If the Movie Camera is turned off, the smaller picture will disappear.
- A title cannot be inserted into the smaller picture.

■Playing Back

Repeat Playback

If you continue to press the [▶] Button for 5 seconds or longer, the Movie Camera switches to Repeat Playback Mode, and the [R ▷] Indication appears. (To cancel Repeat Playback Mode, set the [OFF/ON/MODE] Switch to [OFF].)

Listening to Playback Sound through Headphones

If you want to use headphones to listen to the playback sound, set [AV JACK] on the [AV IN/OUT SETUP] Sub-Menu to [OUT/PHONES] and connect headphones to the [PHONES] Socket **(→ 6)** on the Movie Camera.
In this case, no sound (including a warning sound and shutter sound) will be reproduced through the built-in speaker of the Movie Camera.

Choosing Sound during Playback

You can select the sound by using the [AUDIO OUT] setting on the [PLAYBACK FUNCTIONS] Sub-Menu.

STEREO:	Stereo Sound (main sound and sub sound)
L:	Left channel sound (main sound)
R:	Right channel sound (sub sound)

- If an attempt was made to perform audio dubbing for what was recorded with [12bit] selected as the [AUDIO REC] setting, the sound played back will be set to stereo regardless of the [AUDIO OUT] setting if [12bit AUDIO] is set to [MIX].

■Index Search Functions

- Index Search may not be possible at the beginning of tape.
- Because Photoshot Index Signals are not recorded on still pictures recorded in Continuous Photoshot Mode, the Photoshot Index Search Function cannot be used for these still pictures.
- Scene Index Search may not function properly if the interval between 2 scene index signals is shorter than 1 minute.

■Playback Zoom Function

- You cannot adjust the sound volume with the Remote Controller in Playback Zoom Mode.
- If you turn off the Movie Camera power or if you switch from VCR Mode to Camera Mode, Playback Zoom Mode is automatically cancelled.
- Even if Playback Zoom Functions are being used, images that are output from the DV Terminal **(→ 32)** or Digital Still Picture Terminal **(→ 43)** are not enlarged.
- As you enlarge an image, the quality of image suffers.
- When the Multi-Picture Mode is selected in the Playback Zoom Mode, the equivalent multiple (1×) is used for the zoom magnification.
- During a playback zoom, the Variable Speed Search Function cannot be used with the Remote Controller.

■Playback Digital Effect Functions

- Signals of images to which digital effects are added during playback cannot be output from the DV Terminal **(→ 32)** or Digital Still Picture Terminal **(→ 43)**.
- You cannot use the Wipe or Mix Function while playing back the non-recorded portion of tape.

Multi-Picture Mode (VCR Mode)

- The quality of Multi images deteriorates slightly.
- Playback multi-mode screens cannot be output through the DV Terminal or Digital Still Picture Terminal.
- If there is input from the DV Terminal, a multi screen cannot be created.
- When signals are input from the S-Video Input/Output Socket or Audio-Video Input/Output Socket, a multi screen cannot be re-displayed.
- Signals input from the S-Video Input/Output Socket or Audio-Video Input/Output Socket cannot be displayed on a multi screen.
- If you switch the Movie Camera from the Index Multi-Picture Mode over to the Camera Mode, the setting of [SCAN MODE] on the [MULTI-PICTURES] Sub-Menu of the [CAMERA FUNCTIONS] Main-Menu is automatically set to [STROBE].

Audio Dubbing

- The blank section of a tape cannot be dubbed.
- Sounds sent through the DV Terminal cannot be dubbed.
- If a tape has a non-recorded portion when the tape is dubbed, images and sounds may be disturbed when this portion of the tape is played back.
- If you set the tape counter back to 0 at the position where you want to stop Audio Dubbing so as to make it possible to use the Memory Stop Function (➔ 56), Audio Dubbing is terminated automatically when the tape reaches this position.
- In the case of importing data recorded with Audio Dubbing to a PC using the PC's software programme, only the original sound (ST1) may be imported, depending on the software programme.

Recording the Contents of Other Equipment

Recording to a Card

If you set the [TAPE/CARD] Selector to [CARD] and set the [PICTURE/MPEG4/VOICE] Selector Switch to [PICTURE] or [MPEG4], you can record for external input signals.

- When using the Battery Adaptor Unit, you can not record the contents of other equipment.
- Black streaks may appear at the 4 edges of the image.
- If the [PICTURE/MPEG4/VOICE] Selector is set to [VOICE], recording to a card is not possible.

To Record Picture:

1 After Playing back the contents of external equipment, press the [PHOTO SHOT] Button.

- While recording with analog input, a card photoshot cannot be used.
- The picture size recorded from an external input or a tape is [640×480]. (It is not a mega pixel still picture recording.)
- When the [PHOTO SHOT] Button is pressed, the image may seem to move backward momentarily, but this does not affect the recording.

To Record Moving Picture (MPEG4):

1 After playing back the contents of external equipment, press the start/stop Button.

Analog-Digital Conversion

- When the Movie Camera is connected with other digital video equipment through its DV Terminal, images recorded in analog form from other external equipment can be output to the digital video equipment through the DV Terminal.
- To DV-output analog video signals sent from other equipment, set [DV OUT] on the [AV IN/OUT SETUP] Sub-Menu to [ON]. (Normally, keep the [DV OUT] set to [OFF]. If it is set to [ON], the quality of the image may be disturbed.)

Using the DV Cable for Recording (Digital Dubbing)

- Regardless of the setting, digital dubbing is carried out automatically in the same audio recording mode as that of the Cassette on the playback-side.
- The images on the monitor of the recording side may be disturbed, but it does not affect the recorded images.
- Even if Playback Digital Effects, Playback Zoom, or Playback Title In have been used, these effects are not output from the DV Terminal.
- Even if you use device equipped with DV Terminals (such as i.LINK), you may not be able to perform Digital Dubbing in some cases.

About the Battery Adaptor Unit

- To protect the internal electric circuit and the data on the Memory Card, attaching/removing the Battery Adaptor Unit is invalid when Movie Camera Off/On Switch is set to on.
- It is not possible to use the Battery Adaptor Unit only.
- It is possible only the operation for Card.
- When attaching the Battery Adaptor Unit, the Microphone on the Movie Camera becomes unavailable and the Microphone on the Battery Adaptor Unit operates. (The Microphone becomes monaural.)
- When removing, be carefull not to drop the Camera Unit and the Video Unit by holding them tight.
- Do not attach the Battery while the Battery Adaptor Unit or the Video Unit is removed from the Camera Unit.
- The Remote Controller cannot be used when the Battery Adaptor Unit is used.
- Wind Cut Function cannot be used when the Battery Adaptor Unit is used.

Recording on a Card

- The Shutter Effect cannot be used.
- If [NORMAL] or [ECONOMY] is selected for recording, mosaic-pattern noise may appear on a playback image depending on the image content.
- During automatic copying tape on a card, the number of pictures that can still be recorded on the Card is displayed. When it becomes [0], the Tape is set to the Recording Pause Mode.
- Pictures with wide-screen format signals cannot be copied.
- The size of the Picture recorded from Tape to Card is [640×480].

Card PhotoShot

- The sound cannot be recorded.
- The Shutter Effect cannot be used.
- The Progressive Function is set to [ON].
- The shutter speed becomes 1/50-1/500. (or 1/25-1/500: for Mega Pixel Recording)
- When viewed on a TV or liquid crystal monitor, image quality deteriorates slightly.
- The screen becomes sligtly wider.
- Mega-pixel images cannot be recorded on a cassette as a Mega-pixel picture.
- Digital zooming **(➔ 20)**, Digital effects **(➔ 24, 25)** and Cinema Mode **(➔ 21)** are disabled during Card Photoshot recording.
- Title in/Title creation **(➔ 40)** and Image Stabilizer Function **(➔ 20)** are disabled during Mega-Pixel recording.

Recording Moving Picture (MPEG4)/ Recording Voice (Voice Recording)

- MPEG stands for Motion Picture Expert Group, a name of colour moving picture format. MPEG4 uses ASF(Advanced Streaming Format) for recording and can be played back with Windows Media Player. Because of small size, this File is well suited for transmitting data through telephone lines etc.
- The video resolution of the camera is reduced when making an MPEG4 recording. This is done in order to optimize the image quality in MPEG4 recordings, and does not reflect a problem with the software or hardware.
- The recorded Voice file is automatically locked (to prevent accidental erasure).
- Sound is recorded mono.
- The shutter speed becomes 1/50-1/500. (MPEG4 only)
- The following functions cannot be used:
  - Digital zooming **(➔ 20)**
  - Digital effects **(➔ 24, 25)**
  - Cinema Mode **(➔ 21)**
  - Fade in/out **(➔ 20)**
  - Title in/Title creation **(➔ 40)**

Video Flash

- When the [FLASH] on the [RECORDING SETUP] Sub-Menu is set to [AUTO] and the Movie Camera's shutter speed or iris is adjusted, the [ϟ] Indication may disappear and the Video Flash may not fire.
- The shutter speed and iris value, white balance Mode are fixed when the Video Flash is used.
- Using the Video Flash outdoors or with backlight or other bright conditions may result in white blotches (colour blotches) on the pictures.
- Under backlight conditions, either adjust the iris manually or use the Backlight Compensation Function.
- If flash is fired in front of white background, the recorded object may be dark.
- If a Lens Hood or a Conversion Lens is attached, flashlight may be blocked and become vignetting.

Playing Back a Card

- If a blank (nothing recorded) Card is played, the screen becomes white and the [NO FILE] Indication appears.
- If you try to play back a file recorded in a different format or a picture whose image data is defective, the [×] Indication and the [CARD ERROR] indication may appear as warnings.
- This Movie Camera can also play back the Mega-Pixel still pictures recorded with the other equipment. However it takes longer than usual.
- When playing back a picture recorded by another equipment, its size and that of this Movie Camera may be indicated differently.
- There are no hardware or software compatible with the voice data. Even our Movie Camera products (NV-MX7), SD-Juke box and IC recorders (RR-XR320) compatible with SD memory card cannot playback the voice data.
- If the object is moving fast or zoom is used when playing back Moving Picture (MPEG4), picture may appear to be still or produce mosaic: this is not a malfunction.
- Do not switch [PICTURE/MPEG4/VOICE] selector switch while playing back.

Voice Power Save

This function is available when playing back Voice data only. When [VOICE POWER SAVE] on the [OTHER FUNCTION] Sub-Menu is set to [ON], the Power Saving Function is activated, and several seconds after the play and other operations the display is cleared, and the screen becomes dark.

However, this function does not work during menu screen operations or while the volume is being adjusted.

- The Power Saving Function is released when any operation is performed.
- Do not forget to turn off the power.

Slide Show

- The playback time can be set from 5 to 99 seconds.
- Perform the Slide Show settings with your own Movie Camera in use.
- It may take playback time longer than usual time depending on the picture.
- If you perform the Slide Show after the Titles are displayed, the Titles disappear.
- During the Slide Show, adding the title is not possible.
- Slide Show cannot be set up with Moving File (MPEG4) or Voice File.

Creating a Title

- Even if the contrast of the Title is adjusted, the portions where there is little difference between light and dark and where the boundary between light and dark is unclear may not appear.
- The Title may not appear well if something small is used for it.
- If titles are created, the number of images that can be recorded on a Card decreases.
- If the number of images that can be recorded on a Card is small, you may not be able to create a title.
- Regardless of the [PICTURE SIZE] setting, the size of the created title picture is [640×480].
- The [CREATE TITLE] cannot be selected when [1200×900] has been selected as the [PICTURE SIZE] setting while the [TAPE/CARD] Selector is set to [CARD].

Adding a Title

- When the [PICTURE/MPEG4/VOICE] Selector Switch is set to [MPEG4] or [VOICE], title in is not possible.
- When a title is displayed in playback mode, the title is not output from the DV Terminal or Digital Still Picture Terminal.
- If you press the [TITLE] Button, the last original title is displayed. When an original title is not created, the preset title is displayed.
- The Multi-Picture Mode cannot be used once titles are inserted.
- If an original title is recorded, it is added at the end of the preset title.
- The Title Function cannot be used with cinema Function and Digital Effects simultaneously.
- When the [TAPE/CARD] Selector is set to [CARD] and [1200×900] is selected for [PICTURE SIZE], titles are not displayed.

Using a Card in a Personal Computer

- To erase the file data recorded on the card by using this Movie Camera, be sure to erase them on the Movie Camera not on the computer.
- To use the images on a Card on a personal computer, the optional USB Reader Writer for SD Memory Card (BN-SDCAPE) or PC Card Adaptor for SD Memory Card (BN-SDABPE) aiso enables you to import the files into computer. There are cases in which it cannot be used depending on a personal computer, so please consult the dealer.
- Using the optional DV Editing Software (MotionDV STUDIO) (VW-DTA20/21/22), variety of visual effects can be added and title can be created.
- You may not be able to properly play back or search the images on the Movie Camera after editing the recorded data or changing the image data on a personal computer.
- The image data files recorded on the Card with this Movie Camera conform to the DCF (Design Rules for Camera Files Systems universal standard) stipulated by JEITA (Japan Electronics and Information Technology Industries Association).
- Moving Picture format (MPEG4) that can be played back on this device is ASF. (Depending on the file, it may not be able to be played back even if it is in ASF format.)
- The memory capacity indicated on the SD Card label corresponds to the total amount of the capacity to protect and manage the copyright and of the capacity available as a conventional memory for a Movie Camera, Personal Computer or others.

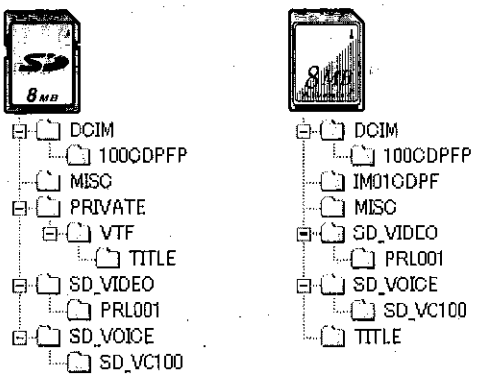
  Capacity that can be used as conventional memory:

  8MB Card about 6.800.000 bytes

The supplied SD Memory Card contains Preset title so the actual capacity may be smaller.

Constructing a Folder when the Card is used with a PC

- When a Card with data recorded on it is inserted into a personal computer, folders will be displayed as in the figure.



[100cdpfp]: The images (Imga0001.jpg, etc.) in this folder are recorded in the JPEG format.

[Misc]: Files in which DPOF Data has been set to the image are in this.

[Title]: Title contains the data of the preset titles (Pre00001.ttl) and original titles (Usr00001.jpg, Usr00001.ttl, etc.).

[PRL001]: MPEG4 moving picture is recorded in ASF format (MOL00001.asf etc.). It can be played back with Windows Media Player (ver.6.4 and later). Because of small size, this File is well suited for transmitting data through telephone line etc.. To play back moving picture with Windows Media Player, select a file and double click. Necessary software is automatically downloaded and starts playing back. (Internet connection is required).

- In the Card Photoshot Mode, the Movie Camera automatically saves file numbers (Imga0001.jpg, etc.) along with the images. The file numbers are recorded with each image as a consecutive number.
- [SD_VC100] contains recorded Voice Data (MOB001.VM1 etc.), but it cannot be played back in a Personal Computer.
- The "SD_VOICE" folder and the Voice files in the folder are set as hidden.Depending on the settings of your personal computer, this hidden folder and these hidden files might not appear in Windows Explorer or the "My Computer" screen.
- [DCIM], [IM01CDPF], [PRIVATE], [VTF], [SD_VIDEO], [SD-VOICE] etc. are necessary items in the folder structure. They have nothing to do with actual operations.

Cautions for Use

■After Use

1 **Take out the Cassette. (➔ 11)**
2 **Set the [OFF/ON/MODE] Switch to [OFF].**
3 **Remove the Card.**
4 **Detach the power supply and retract the Viewfinder or the LCD Monitor. (➔ 10, 12)**
5 **To protect the Lens, attach the supplied Lens Cap.**

■Cautions for Use

When you use your Movie Camera in a rainy or snowy day or on a beach, make sure that no water enters inside the Movie Camera.

- Water may cause the Movie Camera or Cassette to malfunction. (Irreparable failure may occur.)
- If sea water splashes onto the Movie Camera, wet a soft cloth with tap water, wring it well, and use it to wipe the camera body carefully. Then, wipe it again thoroughly with a soft dry cloth.

Keep the Movie Camera away from magnetized equipment (such as a microwave oven, TV, video game equipment, etc.).

- If you use the Movie Camera on or near a TV, images or sounds may be disturbed due to electromagnetic wave radiation.
- Do not use near a cell phone because doing so may cause noise to adversely affect the picture and sound.
- By strong magnetic fields created by speakers or large motors, recording on the tape may be damaged, or images may be distorted.
- Electromagnetic wave radiation generated by a microprocessor may adversely affect the Movie Camera, causing the disturbance of images and sounds.
- If the Movie Camera is affected by magnetically charged equipment and does not function properly, turn off the Movie Camera power and detach the Battery or AC Adaptor and then connect the Battery or AC Adaptor again. Thereafter, turn on the Movie Camera power.

Do not use your Movie Camera near radio transmitters or high-voltage lines.

- If you record pictures near radio transmitters or high-voltage lines, recorded images or sounds may be adversely affected.

Do not use this Movie Camera for surveillance purpose or other business use.

- If you use the Movie Camera for a long period of time, the internal temperature increases and, consequently, this may cause malfunction.
- This Movie Camera is not intended for business use.

When you use your Movie Camera on a beach or similar place, do not let sand or fine dust get into the Movie Camera.

- Sand or dust may damage the Movie Camera or Cassette. (Care should be taken when inserting and removing the Cassette.)

Do not spray insecticides or volatile chemicals onto the Movie Camera.

- If the Movie Camera is sprayed with such chemicals, the camera body may be deformed and the surface finish may peel off.
- Do not keep rubber or plastic product in contact with the Movie Camera for a long period of time.

Do not use benzine, thinner or alcohol for cleaning the Movie Camera.

- The camera body may be deformed and the surface finish may peel off.
- Before cleaning, detach the Battery or pull out the AC Mains Lead from the AC mains socket.
- Wipe the Movie Camera with a soft dry cloth. To remove stubborn stains, wipe with a cloth that is soaked in a detergent diluted with water and afterward finish wiping with a dry cloth.
- For storing or transporting the Movie Camera, place it in a bag or case lined with soft pads so as to prevent the coating on the camera body from being worn.

After use, be sure to take the Cassette out and detach the Battery from the Movie Camera or pull out the AC Mains Lead from AC mains socket.

- If the Cassette is left in the Movie Camera, the tape sags and deteriorates.
- If the Battery is left on the Movie Camera for a long time, the voltage drops excessively, and the Battery will not function even after it is recharged.

■About AC Adaptor

- When the Battery is attached or removed during charging, the [CHARGE] Lamps may temporarily fail to show the correct display or they may go off for a moment because the charge is being measured: this is normal and not a malfunction.
- When the Battery is re-attached while the [QUICK] Lamp is lit and the [100%] Lamp is flashing, the [QUICK] Lamp starts flashing again, and it may take some moments for the lamp to stop flashing and light up: this is normal and not a malfunction.If the Battery is warm, charging takes a longer time than normal.
- If you use the AC Adaptor near a radio, radio reception may be disturbed. Keep the AC Adaptor 1 metre or more away from radio.
- When the AC Adaptor is in use, it may generate whirring sounds. However, this is normal.
- After use, be sure to pull out the AC Mains Lead from the AC mains socket. (If they are left connected, a small amount of electricity is consumed.)
- Keep the electrodes of the AC Adaptor and Battery always clean.

Condensation

If the Condensation Indication flashes after the Movie Camera is turned on, condensation has formed inside the Movie Camera. In this case, the Movie Camera power is turned off automatically after about 1 minute.
Follow the steps below:

1 Take out the Cassette.
- None of the other functions operate. Depending on the amount of condensation, removing the Cassette may even become difficult. If this happens, wait for 2 to 3 hours before taking the Cassette out.

2 Open the Cassette Compartment Cover and wait for 2 to 3 hours.
- The number of hours to wait depends on the amount of condensation and ambient temperature.

3 2 to 3 hours later, turn on the Movie Camera power and check to see if the Condensation Indication is displayed.
- Even if the Condensation Indication is not displayed, as a precaution, please wait for another hour before using the Movie Camera.

Watch for Condensation even before the Condensation Indication is displayed.
- Because condensation takes place gradually, the Condensation Indication may not be displayed during the first 10 to 15 minutes of condensation formation inside the Movie Camera.
- In extremely cold places, condensation may freeze and form frost. In this case, the frost melts first, thus forming condensation, and then it takes another 2 to 3 hours to eliminate the condensation.

When the Lens is Fogged:
Set the [OFF/ON/MODE] Switch to [OFF] and leave the Movie Camera in this condition for about 1 hour. When the lens temperature becomes close to the ambient temperature, the fog disappears naturally.

Video Head Clogging and Care

If the heads (the parts that make contact with tape) are dirty, mosaic-pattern noise may appear on the playback image, or the screen as a whole becomes black. If the heads are extremely dirty, recording performance deteriorates, and, in the worst case, the Movie Camera cannot record at all.

Causes of Dirty Heads
- Large quantity of dust in the air
- High-temperature and high-humidity environment
- Damaged tape
- Long operating hours

Using Mini-DV Format Digital Video Head Cleaner

1 Insert the Head Cleaner into the Movie Camera in the same manner as a Video Cassette.

2 Press the [▶] Button, and approximately 20 seconds later, press the [■] Button. (Do not rewind the tape.)

3 Take out the Head Cleaner. Insert a Video Cassette and start recording. Then, play the tape back to check the recorded image.

4 If the image is not still clear, repeat Steps 1 to 3. (Do not use the Head Cleaner for 3 times or more consecutively.)

Notes:
- Do not rewind every time you use the Head Cleaner. Rewind only when the tape reaches the end, and then use it again from the beginning in the same manner as before.
- If the heads become dirty soon after cleaning, the tape may be damaged. In this case, immediately stop using that Cassette.
- Do not clean the heads excessively. (Excessive cleaning may cause excessive wear of the heads. If the heads are worn, images cannot be played back even after the heads are cleaned.)
- If the dirty heads cannot be cleaned with the Head Cleaner, the Movie Camera needs to be cleaned at a service centre. Please consult a dealer.
- Video Head Cleaners can be purchased from service centres.
- Head cleaning due to dirty heads is not considered a malfunction of the product. It is not covered by the warranty.

Periodical Check-up
To maintain the highest image quality, we recommend replacement of worn parts, such as heads, etc., after approximately 1000 hours of use. (This, however, depends on operating conditions, such as temperature, humidity, dust, etc.)

Optimal Use of the Battery

Battery Characteristics
This Battery is a rechargeable lithium ion battery. Its ability to generate power is based upon the chemical reaction that takes place inside it. This reaction is susceptible to the surrounding temperature and humidity, and, if the temperature is too high or too low, the operating time of the Battery becomes shorter. If the Battery is used in an extremely cold environment, the Battery may operate only for about 5 minutes. If the Battery becomes extremely hot, a protective function may operate, and the Battery may become unusable for a while.

Be Sure to Detach the Battery after Use
Be sure to detach the Battery from the Movie Camera. (If it is left attached to the Movie Camera, a minute amount of current is consumed even when the Movie Camera power is off.) If the Battery is left attached to the Movie Camera for a long time, over discharge takes place. The Battery may become unusable after it is charged.

Disposing of an Unusable Battery
- The Battery has a limited life.
- Do not throw the Battery into fire because it may cause an explosion.

Always Keep the Terminals of the Battery Clean
Prevent the terminals from getting clogged with dirt, dust, or other substances.
If you drop the Battery accidentally, check to see if the Battery body and terminals are deformed.
Attaching a deformed Battery to the Movie Camera or AC Adaptor may damage the Movie Camera or AC Adaptor.

■Cautions for Storage

Before storing the Movie Camera, take the Cassette out and detach the Battery.

Store all the components in a dry place with a relatively stable temperature.

(Recommended Temperature:15 to 25°C, Recommended Humidity:40 to 60%)

Movie Camera

- Wrap it with a soft cloth to prevent dust from getting into the Camera.
- Do not leave the Movie Camera in places that expose it to high temperature.

Battery

- Extremely high temperatures or low temperatures will shorten the life of the Battery.
- If the Battery is kept in smoky or dusty places, the terminal may rust and cause malfunctions.
- **Do not allow the Battery terminals to come in contact with metal objects (such as necklaces, hairpins, etc.). This can result in a short circuit or heat generation and, if you touch the Battery in this condition, you may be badly burned.**
- Store the Battery in a completely discharged state. To store the Battery for a long period of time, we recommend you charge it once every year and store it again after you completely use up the charged capacity.

Cassette

- Before storing it, rewind the tape to the beginning. If the Cassette is left for more than 6 months with the tape stopped midway, the tape sags (although it depends on the storage condition). Be sure to rewind to the beginning.
- Store the Cassette in its case. Dust, direct sunlight (ultraviolet rays), or humidity may damage the tape. Dust contains hard mineral particles, and dusty Cassettes damage the heads of the Movie Camera and other components. Develop a habit of returning the Cassette back to its case.
- Once every half year, wind the tape to the end and then rewind it to the beginning. If the Cassette is left for 1 year or longer without winding or rewinding, temperature and humidity changes may cause the Cassette to deform due to swelling, shrinking, and so forth. The wound tape may stick to itself.
- Do not place a Cassette near highly magnetic substances or equipment.
- The surface of tape is covered with extremely minute magnetic particles, upon which signals are recorded. Magnetic necklaces, toys, etc., have magnetic force that is stronger than you may normally expect, and they may erase the contents of a recording or may cause noise in images and sounds.

Card

- When the Card is being read, do not remove the Card, turn off the power, or subject it to vibration or impact.
- Do not leave the Card in places where there is high temperature or direct sunlight, or where electromagnetic waves or static electricity are easily generated.
- Do not bend or drop the Card. The Card or the recorded content may be damaged.
- After use, be sure to remove the Card from the Movie Camera.
- After use, store the supplied SD memory card in the enclosed yellow bag.
- Do not touch the terminals on the back of the Card with your fingers. Do not allow dirt, dust or water to enter it.

■LCD Monitor/Viewfinder/Lens Hood

LCD Monitor

- In a place with drastic temperature changes, condensation may form on the LCD Monitor. Wipe it with soft dry cloth.
- If your Movie Camera is extremely cold when you turn its power on, the image on the LCD Monitor is slightly darker than usual at first. However, as the internal temperature increases, it goes back to the normal brightness.

Extremely high precision technology is employed to produce the LCD Monitor screen featuring a total of approximately 110,000 pixels. The result is more than 99.99% effective pixels with a mere 0.01% of the pixels inactive or always lit. However, this is not a malfunction and does not affect the recorded picture.

Viewfinder

- Do not direct the Viewfinder or Lens to the sun. Internal components may be seriously damaged.
- When the Movie Camera is used with a large capacity Battery attached to it, it is not practical to look in the Viewfinder from behind the Battery. In this case, lift up the Viewfinder to an easy-to-see angle.

Extremely high precision technology is employed to produce the Viewfinder screen featuring a total of approximately 113,000 pixels. The result is more than 99.99% effective pixels with a mere 0.01% of the pixels inactive or always lit. However, this is not a malfunction and does not affect the recorded picture.

Lens Hood

- Do not attach other conversion lenses in front of the Lens Hood; there is no mount to be used for the attachment.
- When you want to attach the Tele Conversion Lens (VW-LT3714ME; optional) or Wide Conversion Lens (VW-LW3707ME; optional), first of all, turn the Lens Hood counterclockwise. If the MC Protector (VW-LMC37E; optional) or ND Filter (VW-LND37E; optional) is used, the Lens Hood can be mounted on the filter.
- If you push the [W/T] Lever toward [W] during recording with the filter or conversion lens attached to the Movie Camera, 4 corners of the image may become dark (vignetting). For details, please refer to the operating instructions of your accessories.
- Be sure to keep the Lens Hood attached to the Movie Camera so as to shut out unnecessary light.
- Remove the Lens Hood attached to this Movie Camera first before attaching the supplied Lens Hood for MEGA Still Picture Recording.

Before Requesting Repair (Problems and Solutions)

Power

1: The Movie Camera power cannot be turned on.

1-1: Is the power source connected correctly? **(➔ 10)**

1-2: Is Camera Unit well locked until it makes the click sound? If Camera Unit is not completely installed power won't be on.

2: The Movie Camera power is turned off automatically.

2: If you leave the Movie Camera in Recording Pause Mode for more than 6 minutes, the power is turned off automatically to protect the tape and to save the Battery power. **(➔ 18)**

3: The Movie Camera power does not stay on long enough.

3-1: Is the Battery low? Charge the Battery or attach a fully charged Battery. **(➔ 10)**

3-2: Has condensation occurred? Wait until the Condensation Indication disappears. (➔ 53)

Battery

1: Battery runs down quickly.

1-1: Is the Battery fully charged? Charge it with the AC Adaptor. (➔ 10)

1-2: Are you using the Battery in an extremely cold place? In cold places, the operating time of the Battery becomes shorter. (➔ 53)

1-3: Has the Battery worn out? If the operating time is still too short even after the Battery is fully charged, the Battery has worn out.

2: The Battery cannot be charged.

2: If the DC Input Lead is connected to the AC Adaptor, charging cannot be performed. Disconnect the DC Input Lead.

Normal Recording

1: Recording does not start although power is supplied to the Movie Camera and the Cassette is correctly inserted.

1-1: Is the accidental erasure prevention slider on the Cassette open? If it is open (set to [SAVE]), recording cannot be performed. (➔ 11)

1-2: Is the tape wound to the end? Insert a new Cassette. (➔ 11)

1-3: Is the Movie Camera power turned on? (➔ 18)

1-4: Is the [CAMERA] Lamp on? If the [CAMERA] Lamp is not on, no recording function can be operated. (➔ 18)

1-5: Has condensation occurred? Wait until the Condensation Indication disappears. (➔ 53)

Other Recording

1: Auto Focus Function does not work.

1-1: Is Manual Focus Mode selected? If Auto Focus Mode is selected, focus is automatically adjusted. (➔ 23)

1-2: There are some recording subjects and recording surroundings for which the Auto Focus Function does not operate correctly. In this case, use the Manual Focus Mode to adjust the focus. (➔ 56)

Editing

1: Audio dubbing cannot be performed.

1: Are you attempting to edit a tape portion that was recorded in LP Mode? LP Mode does not allow audio dubbing to operate. (➔ 17)

Indications

1: The Time Code becomes inaccurate.

1: The Time Code Indication counter may not be constant in the reverse direction in Slow Motion Playback Mode, but this is not a malfunction.

2: The Remaining Tape Time Indication disappears.

2: When you record still pictures in Photoshot Mode, the Remaining Tape Time Indication may disappear temporarily. However, it reappears when recording normally.

3: The Remaining Tape Time Indication does not match the actual remaining tape time.

3-1: If scenes of less than 15 seconds are continuously recorded, the remaining tape time cannot be displayed correctly.

3-2: In some cases, the Remaining Tape Time Indication may show remaining tape time that is 2 to 3 minutes shorter than the actual remaining tape time.

Playback (Images)

1: Images cannot be played back even when the [▶] Button is pressed.

1: Is the [VCR] Lamp on? If the [VCR] Lamp is not on, the playback function cannot be used. (➔ 26)

2: Mosaic-pattern noise appears on images during Cue, Review or Slow Motion Playback.

2: This phenomenon is characteristic of digital video systems. It is not a malfunction.

3: Although the Movie Camera is correctly connected to a TV, playback images cannot be seen.

3: Have you selected "Video Input" on the TV? Please read the operating instructions of your TV and select the channel that matches the input sockets used for the connection.

4: Playback image is not clear.

4: Are the heads of the Movie Camera dirty? If the heads are dirty, playback image cannot be clear. (➔ 53)

Playback (Sound)

1: Sound is not played back from the built-in speaker of the Movie Camera or the headphones.

1: Is the volume too low? During playback, keep pressing the [PUSH] Dial until the [VOLUME] Indication appears. Then, turn the [PUSH] Dial to adjust the volume. (➔ 26)

2: Different sounds are reproduced at the same time.

2: [12bit AUDIO] on the [PLAYBACK FUNCTIONS] Sub-Menu of the [VCR FUNCTIONS] Main-Menu has been set to [MIX]. As a result, the original sound and sound that was recorded by audio dubbing are played back together. It is possible to reproduce the sounds separately. (➔ 32)

3: The original sound was erased when audio dubbing was performed.

3: If you perform audio dubbing on a recording done in [16bit] Mode, the original sound will be erased. If you wish to preserve the original sound, be sure to select [12bit] Mode at the time of recording.

4: Sounds cannot be played back.

4-1: Although a Cassette with no audio dubbing is being played, is [12bit AUDIO] on the [PLAYBACK FUNCTIONS] Sub-Menu of the [VCR FUNCTIONS] Main-Menu set to [ST2]? To play back a Cassette with no audio dubbing, [12bit AUDIO] must be set to [ST1]. (➔ 32)

4-2: Is the Variable Speed Search Function working? Press the [▶] Button to cancel the Variable Speed Search Function. (➔ 26)

Card

1: Recorded images are not clear.

1: Is [PICTURE QUALITY] on the [CARD SETUP] Sub-Menu set to [NORMAL] or [ECONOMY]? If recording is done with it set to [ECONOMY] or [NORMAL], pictures with fine details may include a mosaic-like pattern. Set [PICTURE QUALITY] to [FINE]. (➔ 35)

2: Card Photoshot Playback images do not look normal.

2: The image may be damaged. In order to prevent the loss of image data, backing up on a Cassette or a personal computer is recommended. (➔ 38, 43, 51)

3: During Playback the [×] Indication is displayed.

3: The image was either recorded in a different format, or data is damaged.

4: Even if a Card is formatted, it cannot be used.

4: Either the Movie Camera or the Card may be damaged. Please consult a dealer.

Explanation of Terms

■ Digital Video System

In a digital video system, images and sounds are converted into digital signals and recorded on a tape. This complete digital recording is capable of recording and playback with minimal image and sound deterioration.
In addition, it automatically records data, such as Time Code and Date/Time, as digital signals.

Compatibility with S-VHS or VHS Cassettes

Because this Movie Camera employs a digital system for recording image and sound data, it is not compatible with conventional S-VHS or VHS video equipment that employs an analog recording system.
The size and shape of the Cassette are also different.

Compatibility with Output Signals

Because AV signal output from the AV signal output socket is analog (the same as conventional video systems), this Movie Camera can be connected with S-VHS or VHS video or a TV for playback.

■ Focus

Auto Focus Adjustment

The Auto Focus System automatically moves forward and backward the focusing lens inside the Movie Camera to bring the subject into focus so that the subject can be seen clearly. However, the Auto Focus System does not function properly for the following subjects or under the following recording conditions.

Please use the Manual Focus Mode instead.

1) **Recording a subject whose one end is located closer to the Movie Camera and the other end farther away from it**
   - Because Auto Focus makes adjustments at the centre of an image, it may be impossible to focus on a subject that is located in both foreground and background.
2) **Recording a subject behind dirty or dusty glass**
   - Because the focus is on the dirty glass, the subject behind the glass will not be focused.
3) **Recording a subject in dark surroundings**
   - Because the light information that comes through the lens decreases considerably, the Movie Camera cannot focus correctly.
4) **Recording a subject that is surrounded by objects with glossy surfaces or by highly reflective objects**
   - Because the Movie Camera focuses on the objects with glossy surfaces or on highly reflective objects, the recording subject may become blurry.
5) **Recording a fast-moving subject**
   - Because the focus lens inside moves mechanically, it cannot keep up with the fast-moving subject.
6) **Recording a subject with little contrast**
   - Because the Movie Camera achieves focus based upon the vertical lines of an image, a subject with little contrast, such as a white wall, may become blurry.

■ White Balance Adjustment

Depending on the type of light source, the colours recorded by the Movie Camera may be affected. In some cases, images may be recorded with bluish or reddish hue. To minimize the effect of light on the subject's colour, what is called White Balance Adjustment becomes necessary.

White Balance Adjustment

White Balance Adjustment recognizes the colour of light and makes adjustment so that the white colour will become pure white.

Automatic White Balance Adjustment

This Movie Camera stores settings that are optimal for several kinds of general light sources. The Movie Camera determines the hue of light that it receives through the Lens and White Balance Sensor (➔ 7), thereby judging the recording condition, and selects the closest hue setting. This function is called Automatic White Balance Adjustment. However, since white balance settings for only several kinds of light sources are stored, the Auto White Balance Function does not operate properly when recording occurs under light that is out of the range of the setup values.

■ Time Code

Time Code signals are data that indicate time measured in hours, minutes, seconds, and frames (25 frames per second). If this data is included in a recording, an address is assigned to each image on the tape.

- The Time Code is automatically recorded as a part of the sub-code at each recording.
- When a new (previously unrecorded) Cassette is inserted, the Time Code automatically starts from zero. If a recorded Cassette is inserted, the Time Code picks up from the point where the last scene was recorded. (In this case, when the Cassette is inserted, the zero display [0h00m00s00f] may appear, but the Time Code starts from the previous value.)
- The Time Code cannot be reset to zero.
- Unless the Time Code is continuously recorded from the beginning of a tape, accurate editing may not be possible. To ensure that the Time Code will be recorded with no breaks, we recommend the use of the Camera Search Function (➔ 18) or the Blank Search Function (➔ 27) before recording a new scene.

■ Memory Stop Function

The Memory Stop Function is useful for the following operations.

Rewinding or fast-forwarding a tape to a desired position

1 **Set [DISPLAY SETUP] >> [C.DISPLAY] >> [MEMORY].**
2 **Reset the Tape Counter to zero at the tape position from which you want to play it back later.** (➔ 8, 14)
3 **Start playback or recording.**
4 **After playback or recording has finished: Slide the [OFF/ON/MODE] Switch to set the Movie Camera to VCR Mode.**
   - The [VCR] Lamp lights up.
5 **Rewind the tape.**
   - The tape automatically stops approximately at the position where the counter was set to zero.

Stopping editing automatically during audio dubbing

1 **Set [DISPLAY SETUP] >> [C.DISPLAY] >> [MEMORY].**
2 **Reset the Tape Counter to zero at the position where you want to stop editing.**
3 **Play back the still picture where you want to start audio dubbing.**
4 **Start audio dubbing.** (➔ 32)
   - Audio dubbing automatically stops at the position where the counter was set to zero.

Specifications

Digital Video Camera Information for your safety

Power Source:	DC 7.9/7.2 V
Power Consumption:	Recording 4.6 W (When using Viewfinder) 5.5 W (When using LCD Monitor)
Recording Format:	Mini DV (Consumer-use Digital Video SD Format)
Tape Used:	6.35 mm digital video tape
Recording/Playback Time:	SP: 80 min.; LP: 120 min. (with DVM80)
Video	
Recording System:	Digital Component
Television System:	CCIR: 625 lines, 50 fields PAL colour signal
Audio	
Recording System:	PCM Digital Recording 16 bit (48 kHz/2ch), 12 bit (32 kHz/4ch)
Image Sensor:	1/3.8-inch CCD Image Sensor
Lens:	Auto Iris, F1.8, Focal Length; 3.55–35.5 mm, Macro (Full Range AF)
Filter Diameter:	37 mm
Zoom:	10:1 Power Zoom
Monitor:	2.5-inch LCD
Viewfinder:	Colour Electronic Viewfinder
Microphone:	Stereo
Speaker:	1 round speaker Ø 16 mm
Standard Illumination:	1,400 lx
Minimum Required Illumination:	1 lx (Digital Gain-up Mode)
Video Output Level:	1.0 Vp-p, 75 ohm
S-Video Output Level:	Y Output: 1.0 Vp-p, 75 ohm C Output: 0.3 Vp-p, 75 ohm
Audio Output Level (Line):	316 mV, 600 ohm
Video Input Level:	1.0 Vp-p, 75 ohm
S-Video Input Level:	Y Input: 1.0 Vp-p, 75 ohm C Input: 0.3 Vp-p, 75 ohm
Audio Input Level (Line):	316 mV, 10 kohm or more
Digital Still Picture:	Digital Still Picture Output, Control Signal Input/Output (Transfer rate: max. 115 kbps)
USB:	Card reader/writer function, USB 1.1 compliant (maximum 12Mbps)
Digital Interface:	DV Input/Output Terminal (i.LINK, 4-pin)
Dimensions:	Approx. 50 (W)×115 (H)×105.5 (D) mm
Weight:	Approx. 490 g (without Battery and DV cassette) Approx. 555 g (with CGA-D07S and DVM60)
Operating Temperature:	0 °C–40 °C
Operating Humidity:	10%–80%
Card Memory Functions	
Recording Media:	SD Memory Card, MultiMediaCard
Image Compression:	JPEG
Video compression:	MPEG4
Sound compression:	G.726

AC Adaptor Information for your safety

Power Source:	AC 100–240 V, 50/60 Hz
Power Consumption:	35 W
DC Output:	DC 7.9 V, 9 W (Movie Camera Operation) DC 8.4 V, 2.4 A (Battery Charging)
Dimensions:	76 (W)×52 (H)×101 (D) mm
Weight:	Approx. 230 g

Battery Adaptor Unit Information for your safety

Power Source:	DC7.9/7.2 V
Power Consumption:	3.7 W (When using Viewfinder) 4.6 W (When using LCD Monitor)
Video Flash:	GN 6
Microphone:	Monaural
Audio Output Level (Line):	316 mV, 600 ohm
Video Output Level:	1.0 Vp-p, 75 ohm
<SD Camera Style>	
Dimensions:	52 (W)×77 (H)×105.5 (D) mm
Weight:	Approx. 300 g (without Battery) Approx. 345 g (with CGA-D07S)

Weight and dimensions are approximate values.
Specifications may change without prior notice.

Index

A
AC Adaptor ... 10, 52
Audio Dubbing ... 32
Auto Focus ... 56
Automatic White Balance Adjustment ... 56

B
Backlight Compensation ... 21
Battery Adaptor Unit ... 33
Black & White Mode ... 24
Blank Search ... 27

C
Camera Data ... 15
Camera Search ... 18
Card Photoshot ... 34
Card Playback ... 37
Charging the Battery ... 10
Cinema Mode ... 21
Condensation ... 53
Continuous Photoshot ... 19
Cue Playback ... 26

D
Date/Time Indication ... 45
Date/Time Setting ... 17
DCF ... 51
Digital Effect ... 24, 25, 30
Digital Still Picture ... 19
Digital Zoom ... 20
DPOF Setting ... 42
Dubbing ... 31, 32

E
Erasure Prevention Slider ... 11

F
F Number ... 23
Fade ... 20
File Search Mode ... 37
Formatting ... 42

G
Gain-up Mode ... 24

H
Headphones ... 48

I
Iris ... 23

J
Jog Playback ... 27

L
LCD Monitor ... 12
Lock Setting ... 41
Low Light Mode ... 21

M
Macro Close-up ... 19
Manual Focus ... 23
Mega-Pixel Still-Picture Recording ... 34
Memory Stop ... 56
Menu Screen ... 13
Mirror Mode ... 24
Mix Mode ... 24
Mosaic Mode ... 24
Multi-Picture Mode ... 25, 30

N
Negative Mode ... 24

P
Photoshot ... 19, 34
Picture Size ... 34, 37
Picture-in-Picture Mode ... 25
Playback Digital Effect Function ... 29, 30
Playback Zoom ... 29
Portrait Mode ... 21
Programme AE ... 21

R
Recording Check ... 18
Recording Pause Mode ... 18
Recording Speed ... 17
Remaining Tape Time ... 44
Remote Controller ... 8
Repeat Playback ... 48
Review Playback ... 26

S
Self-Recording ... 18
Sepia Mode ... 24
Shutter Speed ... 23
Slide Show ... 39
Slow Motion Playback ... 27
Solarisation Mode ... 24
Sound Volume ... 26
SP/LP Mode ... 17
Sports Mode ... 21
Spotlight Mode ... 21
Still Advance Playback ... 27
Strobe Mode ... 24
Surf & Snow Mode ... 21
Swing Mode ... 25, 30

T
Time Code ... 56
Trailing Effect Mode ... 24

U
USB Connection Kit ... 43

V
Variable Speed Search ... 26
Video Flash ... 36
Video Head Clogging ... 53
Viewfinder ... 12, 54

W
White Balance ... 22, 56
Wipe Mode ... 24

Z
Zoom ... 19

B
VQT9435
F0901Ka0(500 Ⓐ)
C

Matsushita Electric Industrial Co., Ltd.
Web site: http://www.panasonic.co.jp/global/